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THE PRINTING OF THIS PUBLICATION HAS BEEN APPROVED BY
THE DIRECTOR OF THE BUREAU OF THE BUDGET, 20 FEB. 1956

Monthly Message

The United States edition of the NATO Emergency War Surgery Handbook has just been published by the Department of Defense. Its title is EMERGENCY WAR SURGERY: NATO HANDBOOK. The NATO Handbook itself was published by SHAPE and was the result of studies and compilation by a committee of NATO under the direction of the then Brigadier General Wilford F. Hall, USAF (MC). The committee consisted of representatives from Great Britain, France, Canada, and the United States, with consultation and advice from representatives of other NATO nations.

This book, originally published in English, has already appeared in a Turkish edition, and doubtless other countries will republish it. The United States edition, a slightly smaller and condensed version, can be readily carried in one's pocket and is an excellent digest of emergency war surgery, as its name implies. A similar small edition will in all probability be published by Canada and Great Britain. All medical, dental, and veterinary officers in the armed services will receive a copy of this book, and it also may be obtained from the Government Printing Office at a cost of $2.25. Its chapters include information on factors in production of war injuries; factors complicating war injuries; sorting, initial care, and evacuation; anesthesia and analgesia; regional injuries; and a glossary of drugs.

Brigadier General Sam F. Seeley, MC, USA, the Chairman of the NATO committee, was assisted by Colonel Joseph R. Shaeffer, MC, USA, Captain Robert B. Brown, MC, USN, and Colonel David Gold, USAF (MC), in the preparation of the United States Armed Forces edition.

I recommend this book to every member of the medical, dental, pharmaceutical, and osteopathic professions, and to all students in their schools.

Frank B. Berry

FRANK B. BERRY, M. D.
Assistant Secretary of Defense
(Health and Medical)

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Foreword

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal*.

FRANK B. BERRY, M. D.,
Assistant Secretary of Defense (Health and Medical).

MAJOR GENERAL SILAS B. HAYS,
Surgeon General, United States Army.

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Surgeon General, United States Navy.

MAJOR GENERAL DAN C. OGLE,
Surgeon General, United States Air Force.

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CLINICAL TRIAL OF PASTEURIZED POOLED HUMAN PLASMA

WILLIAM C. LEVIN, *M. D.*
TRUMAN G. BLOCKER, Jr., *M. D.*
E. FRANK DUNTON, *M. D.*
MELVIN A. CASBERG, *M. D.*

IT is generally accepted that with the exception of whole blood, the best blood volume expander is pooled human plasma itself. This material offers a number of technical advantages over whole blood. No typing or cross-matching technics are required prior to its administration; it can be stored for years; and technical problems introduced by the collection, storage, and administration of the various blood cells are avoided. Synthetic plasma expanders are inferior to pooled plasma for a number of reasons. Anaphylactoid and pyrogenic reactions, hemorrhagic manifestations, "sludging" of blood, and other untoward clinical reactions have occurred following the use of these synthetic compounds. There is also the theoretical objection that retention of such compounds in the tissues may either exert a carcinogenic effect or produce dysfunction of the organs serving as storage sites. This has been suggested by follow-up studies of patients in Germany who received polyvinylpyrrolidone during World War II.[1-3]

However, experience with lyophilized pooled plasma has produced plentiful evidence that it serves as an effective medium for the transportation and dissemination of the serum hepatitis virus. With very large pools, this has been a most distressing problem, producing a fantastically high incidence

From the Department of Internal Medicine, Department of Surgery (Plastic Surgery Division), and the Hematology Research Laboratory, The University of Texas, Medical Branch, Galveston, Tex.

of serum hepatitis, reported as high as 20 per cent. This problem has prompted the development of two main lines of investigation: (1) the fractionation of plasma proteins, since the virus is presumably concentrated in one of the fractions which can be discarded, thus permitting the concentration of virus-free albumin which exerts a powerful oncotic effect, and (2) the search for an effective means of inactivating the virus without significant altering of the biologic properties of the plasma constituents.

The fractionation program has been most successful from a scientific and technological standpoint but neither ordinary civilian medical needs nor the broader military requirements are completely satisfied by the products of plasma fractionation. In the first place, this is an expensive program from the standpoint of financial cost as well as a large cost in man-hours and the low yield of this process. The administration of albumin produces chiefly an oncotic effect while probably making only a limited nutritional contribution; pooled plasma may exert a somewhat broader effect (such as transfer of immune bodies and coagulation factors). Finally, fractionation, by adding a number of tedious and time-consuming steps to the processing of plasma, does not lend itself to convenient logistic planning for stockpiling and thereby for ready and adequate availability for major civilian catastrophes and military requirements.

Efforts to develop an effective means of plasma sterilization have produced a number of technics. The only two which have apparently been successful in this direction are the storage of liquid plasma at elevated temperature for six months[4,5] and the pasteurization of pooled plasma.[6] The former method, though presumably effective in making the virus nonviable and in failing to produce overt evidences of alteration of biological activity of the plasma, is not wholly satisfactory in the planning of any major stockpiling effort and would be completely impracticable in the event of a nationwide catastrophe, inasmuch as the time required for processing is excessive. Therefore, the development of pasteurization presented the attractive possibility of solving the knotty logistic problem of rapidly producing large quantities of pooled human plasma which would at once be safe to administer and biologically effective as a blood volume expander.

The present study was planned to evaluate both of these points: safety of administration and oncotic effect. The plasma was supplied by U. S. Pharmaceutical, Inc., Burbank, Calif., and was prepared in accordance with the regulations of the Division of Biologic Standards of the National Institutes of Health.[7] Additionally, the plasma was heated to 60°C for 10 hours. This pasteurization procedure is also the final step in preparation of currently accepted human serum albumin.[8]

Previous trials conducted in California consisted of the administration of 130 units to 84 patients. There were 22 readministrations after 1 month. Two patients experienced chest pain—both had advanced pulmonary tuberculosis and were on antimicrobial therapy. Two complained of "chilly" feelings without objective evidence of reaction. Repeat infusion did not produce a similar effect. One patient had elevation of temperature to 100.6°F six hours after infusion which lasted a few hours. In addition to routine clinical laboratory studies, Schultz-Dale tests were performed by Dr. Irving Gordon on serum from 11 of the above patients, and in all instances these were negative.

METHODS

Each of 30 patients who were afebrile received 500 ml* of liquid pasteurized plasma intravenously. Diagnoses among these patients varied considerably, but in no instance was there overt evidence of congestive heart failure, renal disease or disturbance of the blood volume. Some patients who had previously experienced hypersensitivity to foods or drugs were deliberately included in the series.

Clinical and laboratory observations made before, during, and at selected intervals following plasma administration included temperature, pulse, respiratory rate, blood pressure, hemoglobin determination, total leukocyte count, hematocrit, prothrombin time, bleeding time, and urinalysis. Prothrombin and bleeding times were discontinued after two days. Additionally, each patient was carefully observed during the administration of the plasma, at hourly intervals for 12 hours, and at daily intervals for 7 days following injection of the plasma for any evidences of untoward reactions. Whenever possible, it is planned to follow these patients for 9 months in order to recognize the development of any type of liver disease, should it occur. In 12 patients, plasma and blood volumes were determined before the infusion and at 1,6, and 24 hours thereafter by a standard technic using human serum albumin labeled with I^{131}. In 7 of the patients, total serum proteins were measured quantitatively and by paper electrophoresis before the injection and at intervals of 1,6, and 24 hours. The paper strips were quantitatively measured by the use of an integrating densitometer.

Five patients received a second injection of plasma 3 to 4 weeks following the first injection, with observations identical to those described above.

RESULTS

Thirty patients received a total of 35 infusions of pasteurized plasma. In the five patients who received two infusions, an

*The 500 ml volume per cent includes approximately 80 ml of anticoagulant plus 5 per cent by volume of invert sugar.

Figure 1. Influence of infusion of 500 ml of pasteurized pooled human plasma on mean values of hemoglobin, leukocytes, and hematocrit.

interval of 3 to 4 weeks elapsed between the infusions. No reactions definitely attributable to the plasma were observed in any instance, in spite of the fact that seven recipients had given histories of allergies to inhalants, foods, and medications. One of these patients received two infusions of plasma. Twenty-four hours following the administration of the second infusion which had been given 17 days after the first, edema of the hands was observed; however, inasmuch as the patient reported multiple allergies to penicillin, detergents, and calamine lotion, it is doubtful that this symptom was due to the plasma. This is supported by the demonstration of an identical reaction following the application of calamine lotion 8 days later. Three weeks following the second infusion, he was skin-tested with the same plasma and no reaction occurred. A female patient who inadvertently received the plasma very rapidly developed a sensation of lightheadedness, which disappeared as the rate of infusion was reduced. The total volume was administered without other untoward result. No significant changes in blood pressure, pulse rate, or elevation of temperature were recorded. The patients did not complain of any untoward subjective sensations during or following the infusions. In the interest of accuracy and continuity in reporting, most of these infusions were administered and observations were made personally by one of us. To date, 13 to 35 weeks have elapsed since the first and last plasma infusions were administered. Neither jaundice nor other symptoms of hepatitis has occurred in the recipients, though, of course, insufficient time has elapsed to permit a final conclusion about this point. However, inasmuch as this same procedure has been used with success for the sterilization of deliberately contaminated albumin solutions, there is evidence to support the acceptance of the inactivation of the serum hepatitis virus by this process.[9] Figure 1 summarizes peripheral blood observations. Though minor changes in hemoglobin and leukocyte values occurred occasionally, they were not significant. Urinalysis following infusion reflected no proteinuria or increase in proteinuria where it had previously existed and no abnormalities in urinary sediment. Not only were hemorrhagic manifestations absent following plasma administration, but determinations of bleeding time and prothrombin time (one-stage) revealed no alterations (fig. 2).

Plasma volumes and total blood volumes were determined in 12 patients (fig. 3). One hour following infusion, there was an average increase in plasma volume of 225 ml and an average increase of blood volume of 330 ml; at 6 hours there was an average increase in plasma volume of 287 ml and in blood volume of 312 ml; and 24 hours following infusion the average increase of plasma volume was 370 ml, and of blood volume was 409 ml. These findings indicate a satisfactory oncotic effect, which is immediate and yet persists for at least 24 hours.

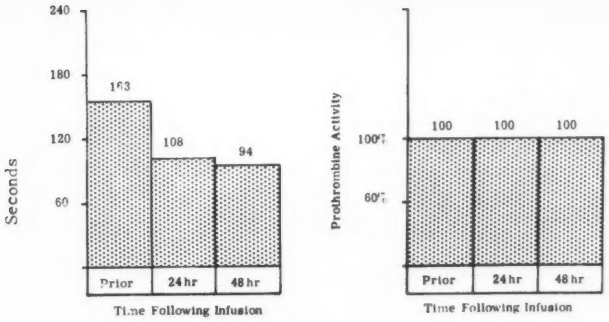

Figure 2. Influence of infusion of 500 ml of pasteurized plasma on mean values of bleeding time, right, and prothrombin activity, left.

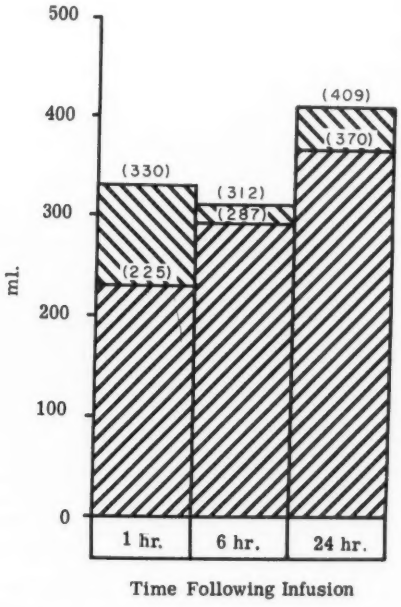

Figure 3. Mean oncotic effect of 500 ml of pasteurized plasma expressed as increase in plasma and blood volumes in milliliters.

The data obtained by electrophoretic separation of serum proteins of the recipients prior to and at 1, 6, and 24 hours following plasma infusion are shown in table 1. No statistically significant alterations of albumin, alpha$_1$, alpha$_2$, beta, or gamma globulins were observed after administration of plasma.

TABLE 1. *Effect of infusion of 500 ml of pasteurized human plasma on mean values of electrophoretic partitions of serum proteins of recipients.*

Time	Albumin	Alpha$_1$	Alpha$_2$	Beta	Gamma
Prior	40.1	6.0	14.9	12.3	26.5
1 hr.	42.1	5.5	14.5	12.6	26.8
6 hr.	40.7	5.9	11.2	13.0	27.1
24 hr.	39.0	6.0	14.2	14.4	33.0

DISCUSSION

Pasteurized plasma used in this study is apparently devoid of any untoward immediate effects. This statement is supported by the absence of subjective and objective evidence of anaphylactoid or other allergic episodes, the absence of symptoms suggestive of significant prejudicial hemodynamic alterations, the failure to demonstrate pyrogenic reactions, the absence of hemorrhagic symptoms or of laboratory evidence of hemorrhagic diatheses, and by the absence of significant alterations of the serum proteins in the recipients of the plasma. From the consideration of these parameters, this preparation appears to be safe. The other experience in 84 patients and the previously reported evidence of the efficacy of pasteurization in the inactivation of the serum hepatitis virus probably assures the long-term safety of this preparation; inasmuch as the pasteurization of the serum albumin has been satisfactorily accomplished by the same method.

In these clinical trials, data suggest also that this plasma preparation exerts a very satisfactory oncotic effect, with the production of almost a calculated optimal increase in plasma and blood volumes in normal recipients, with maintenance of this effect for at least 24 hours.

On the basis of our experience, it is recommended that more extensive clinical trials with this plasma preparation be conducted in order to substantiate further the usefulness of pasteurized pooled human plasma in the treatment of patients who require blood volume expanders. The logistical superiority of this preparation is obvious.

SUMMARY

Pooled human plasma, treated by heating to 60°C for 10 hours to inactivate the serum hepatitis virus has been administered 35 times to 30 patients. No immediate untoward consequences were observed. The oncotic effect of this plasma is completely satisfactory.

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THE STRANGE LANGUAGE OF PSYCHIATRY

"The lack of progress in psychiatry during the past 50 years, barring Freud's contributions to medical anthropology, may well be attributed to the fact that, although psychiatry deals with the obstacles that forfeit man's ability to communicate with his fellow men, it has failed to express itself clearly. For half a century psychiatry has employed a strange language ever more and more confusing and obscure. Fortunately, it is now pulling itself out of this mire, thanks to the success of physiodynamic and organicist psychiatry, which speaks the plain, clear language of biology. Thanks to this, numerous successes have been achieved during the last five years in the psychochemotherapeutic field, and many more will no doubt follow these, until one day the sphinx of mental disease will finally surrender its secret. This goal demands that psychiatrists cease to be mystics and theoreticians, and become biologists and physicians in their explorations into the tenebrous world of mental disease."

—FELIX MARTÍ-IBÁÑEZ, M. D.
in *Antibiotic Medicine and Clinical Therapy*
p. 746, Nov. 1957

PERCUTANEOUS SPLENOPORTOGRAPHY IN PORTAL HYPERTENSION

BENJAMIN H. SULLIVAN, Jr., *Colonel, MC, USA*
ROBERT H. HERMAN, *Captain, MC, USA*
JOHN E. MYERS, Jr., *Captain, MC, USA*

PORTAL HYPERTENSION may arise from obstruction of veins outside the liver, or from intrahepatic causes. Surgical relief by means of a portal vein to vena cava shunt is indicated in cases where esophageal varices develop. These shunts are more satisfactory than splenorenal shunts, but cannot be performed if the portal vein is thrombosed or has undergone cavernous transformation, or if certain other circumstances exist. Roentgenographic visualization of the portal vein and its tributaries is important in distinguishing the site of obstruction so that the proper operative procedure may be selected. Since July 1957, percutaneous splenoportography at this hospital has been a part of the preoperative study of patients with portal hypertension. We wish to report our experience with this diagnostic method.

Patients suspected of having portal hypertension were carefully investigated by history taking, physical examination, and indicated laboratory tests, as well as by liver biopsy and esophagoscopy. Prolongation of bleeding or clotting times, prothrombin time below 40 per cent of normal, or platelet count below 60,000 were accepted as contraindications for splenoportography.

TECHNIC

Seventy-five milligrams of meperidine hydrochloride (Demerol) is given intravenously together with a 1-ml test dose of the contrast material sodium diatrizoate, (50 per cent Hypaque) after the patient is positioned on the radiographic table. Epinephrine and Nalline Hydrochloride (brand of nalorphine hydrochloride) should be available to combat adverse reactions. The patient is instructed in breath holding at this time. By percussion and palpation of the spleen, a site for insertion of the needle is selected. This is usually in the left midaxillary or posterior-axillary line at the eighth or ninth intercostal space. After skin preparation and infiltration with a local anesthetic has been

From Walter Reed Army Hospital, Washington, D. C.

accomplished, the patient is told to hold his breath in mid-inspiration. A No. 18 spinal needle is inserted into the spleen. Slight resistance often can be detected as the needle penetrates the capsule. A flow of venous blood from the needle after the stylet is withdrawn indicates that the needle is within the splenic substance. It is important that the patient not breathe while the needle is being manipulated, otherwise the splenic capsule might be torn. Once the needle is within the spleen, and released by the operator, shallow breathing can be resumed. Splenic pressure is measured with a saline solution-filled manometer connected to the needle by a flexible polyethylene tube. This permits measurements to be made while the patient breathes. Values above 200 mm of saline solution are considered to be abnormally elevated. A Valsalva maneuver will increase the pressure and confirm the correct placement of the needle. The splenoportogram is made by injecting 25 ml of sodium diatrizoate (50 per cent Hypaque) rapidly into the spleen. This is accomplished through a polyethylene tube which connects the syringe to the needle. The needle is removed from the spleen when all of the contrast material has been injected. Serial x-ray exposures are made over a 12-second period using a Schönander biplane film changer. If only a single roentgenogram can be taken, the exposure is made just before the last few milliliters of contrast material are injected. After the procedure, the patient is not permitted to move but is lifted onto a litter, returned to the ward, and lifted into bed. The patient is then kept flat in bed for six hours after which he can sit up. He must, however, remain in bed for 24 hours. Pulse rate and blood pressure are measured frequently for the first six hours.

RESULTS

Thirty splenoportograms were performed in 23 patients in the period from July 1957 through April 1958. There were 19 males and 4 females in this series. The average age was 44 years and the age range was 7 to 68 years. Diagnoses included portal cirrhosis, 10 patients; postnecrotic cirrhosis, 5 patients; biliary cirrhosis, 1 patient; portal vein thrombosis, 2 patients; hemachromatosis, 1 patient; fibrocystic disease, 1 patient; hemangioma of liver, 1 patient; and portal cirrhosis with hepatoma, 2 patients. Portal hypertension was present to some degree in all but two of the patients, and ascites had occurred in 11. Esophageal varices were present in all but two patients and 15 had experienced upper gastrointestinal hemorrhage. Seventeen of these patients had had previous or subsequent surgical shunt procedures to relieve portal hypertension. Only four of this number were splenorenal. The remainder were end-to-side portacaval anastomoses.

The success of splenoportography was evaluated, considering adequacy of radiographic visualization and accuracy of splenic

pulp pressure measurement, as gaged by comparative pressure measurement at time of surgical intervention. Adequate radiographic demonstration of the portal venous system was obtained in 20 of the 23 patients (87 per cent); however, in only 23 of 30 procedures (76.6 per cent) were satisfactory results obtained. The main causes of failure were about equally divided between subcapsular collection of dye, failure to inject the dye into the spleen, and technical failure of the Schönander machine. Pressure measurements were successful and reasonably accurate in 20 of 22 patients, and in 25 of 29 attempts. This figure includes one patient in whom three consecutive attempts were unsatisfactory. Thus satisfactory pressure measurements were obtained in 91 per cent of the patients and in 86 per cent of the attempts. Considering these two sets of data, collectively, it may be said that in only two procedures (6.6 per cent) in the same patient was there absolutely no information gained by splenoportography. This same patient had a third successful splenoportogram, thus the procedure was successfully accomplished in all patients.

There was one complication—one patient bled intraperitoneally sufficiently to justify a 1-liter blood transfusion. He had been unable to remain apneic during the procedure, because of ascites and right hydrothorax. Several patients required one injection of meperidine for right upper quadrant or right shoulder pain.

CASE REPORTS

Case 1. Massive hematemesis caused this 38-year-old Caucasian male medical technician to be hospitalized in March 1956. In January 1956 he had had unexplained melena. There was a past history of gout, prolonged obesity, and renal calculi, but none of hepatitis, excessive alcohol intake, dietary deficiency, or exposure to hepatotoxic agents.

Physical examination revealed obesity and hepatosplenomegaly, but no spider angiomata, alopecia, telangiectasis, palmar erythema, ascites, or other evidence of chronic liver disease.

Laboratory studies showed a mild leukopenia, thrombocytopenia, and anemia. There was 30 per cent sulfobromophthalein sodium retention in 45 minutes. Liver biopsy showed evidence of postnecrotic cirrhosis. Large esophageal varices were seen when esophagoscopy was performed.

A portacaval shunt was planned for 29 May, but because of an anesthesia reaction, this was cancelled. The patient returned to duty and remained free of symptoms until September 1957 when he was again hospitalized for melena. Physical and laboratory findings at that time were essentially unchanged. On 23 October a splenoportogram was performed. The splenic pulp pressure was 350 mm of saline solution, and following the injection of the contrast media a large,

tortuous, dilated splenic vein and occlusion of the portal vein were noted (fig. 1). On 7 November a splenectomy and splenorenal shunt were performed.

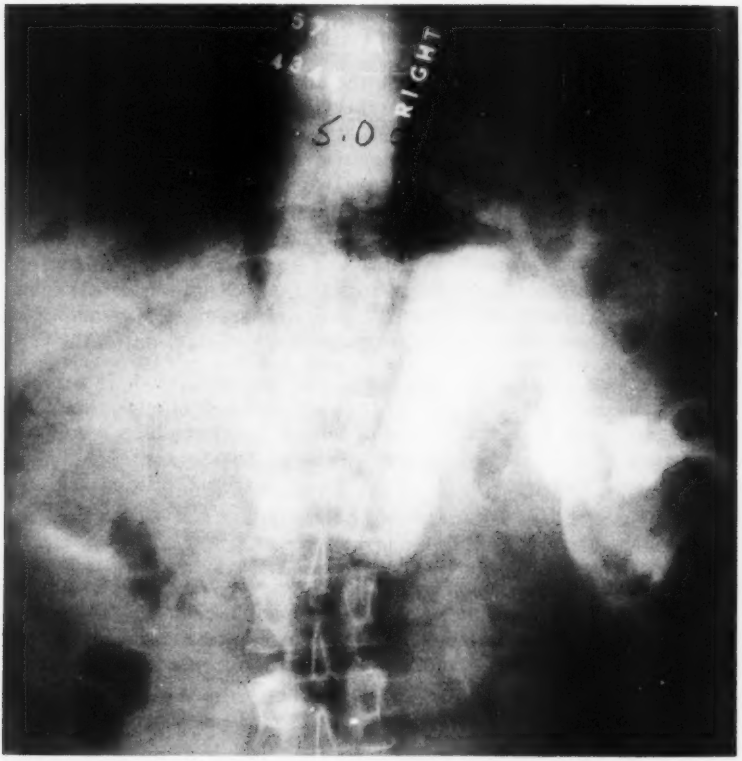

Figure 1 (case 1). Splenoportogram showing dilated, tortuous splenic vein. The portal vein is thrombosed and not visualized. Subcapsular extravasation of contrast material outlines the lower pole of the spleen.

Convalescence was uneventful, and esophagoscopy one month later demonstrated marked reduction in the size of the previously noted varices. The leukopenia and thrombocytopenia were relieved postoperatively and sulfobromophthalein sodium (Bromsulfalein) retention decreased to 16 per cent while the other liver function tests remained normal. The patient returned to duty on 13 December.

Comment. This case demonstrates the value of splenoportography in determining portal vein patency. Accident prevented the first surgical attempt at a portacaval shunt, and the radiographic demonstration of portal vein thrombosis forestalled the second attack. Thus, by permitting selection of the indicated

surgical shunt, splenoportography prevented this patient from undergoing an additional, useless, major surgical procedure.

Case 2. This 15-year-old girl was the only one of five children to survive more than one year. Her siblings died of intestinal obstruction and/or pneumonia. Since early life she had experienced frequent upper respiratory infections and was accustomed to passing six to eight yellow, frothy, bulky, foul-smelling stools a day. Pancreatic insufficiency was diagnosed at the age of five. The patient has been treated with pancreatin granules and a low-fat diet ever since this diagnosis was established. Steatorrhea continued. At age 11 she developed a productive cough, dyspnea on exertion, and roentgenographic evidence of biapical pulmonary infiltrates occurred. Early clubbing of the fingers was noted, and treatment with antibiotics and various expectorants was initiated without symptomatic improvement. At age 14 the patient noted the gradual onset of easy fatigability, general weakness, and malaise. In December 1956 splenomegaly was noted and her hemoglobin level was 5.5 grams per 100 ml. Upper gastrointestinal series, barium enema, and liver function studies were normal. Transfusions were given, and she returned to school. In August 1957 an episode of massive hematemesis occurred which prompted rehospitalization and an eventual transfer to this hospital on 15 October.

Physical examination revealed a small but well-developed and well-nourished 15-year-old white girl with a blood pressure of 110/70 mm Hg. There was a slight increase in thoracic anteroposterior diameter, hyperresonance of the lung fields, and a lower thoracic outward flare. Splenomegaly, clubbing of the fingers, and questionable ascites were the only other positive findings. The liver was normal in size. There was no icterus, spider angiomata, telangiectasis, hair loss, or palmar or plantar erythema.

Laboratory studies showed anemia, thrombocytopenia, and leukopenia. A chromium^{51} red cell-survival study demonstrated evidence of a moderately severe hemolytic process, presumably from hypersplenism. Bone marrow aspiration showed erythroid hyperplasia. Stool fats were consistently well above normal limits, and serum cholesterol was low (123 mg per 100 ml). Stools were negative for trypsin activity. Roentgenograms of the chest and pulmonary function studies indicated the presence of pulmonary emphysema and fibrosis. Liver function studies, including serum bilirubin, thymol turbidity, cephalin-cholesterol flocculation, alkaline phosphatase, sulfobromophthalein sodium retention, total serum proteins, and albumin-globulin ratio were all normal.

On 26 October esophagoscopy revealed moderate-sized varices extending the length of the esophagus. Splenoportography was performed four days later, and the splenic pulp pressure was measured as 440 mm of saline solution. Patent splenic and portal veins were visualized. The patient had a second bout of hemorrhage from varices which precipitated further ascites, icterus, and liver function ab-

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normalities. These rapidly abated following treatment with the Sengstaken-Blakemore tube and blood transfusions. A portacaval end-to-side anastamosis was performed on 14 November, and the portal vein pressures immediately before and after the shunt was established were 460 and 270 mm of saline, respectively. Convalescence was uneventful. A splenoportogram (fig. 2), three weeks after operative

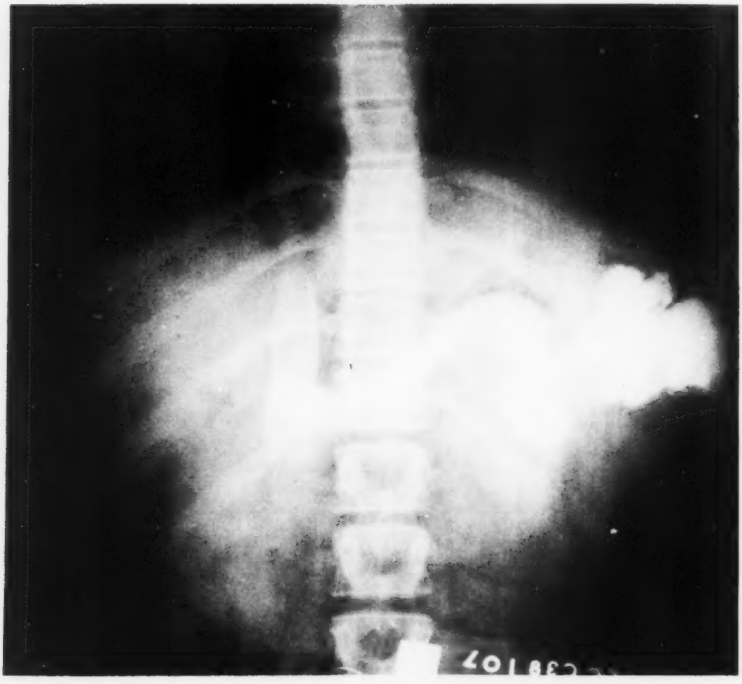

Figure 2 (case 2). Splenoportogram made three weeks after a portacaval shunt operation, showing a tortuous splenic and portal vein still somewhat dilated. The shunt is patent and the inferior vena cava is clearly defined.

procedure, demonstrated a normally functioning shunt and a reduction of splenic pulp pressure to 220 mm of saline. In addition, a marked decrease in the size and extent of the varices was noted by esophagoscopy. The thrombocytopenia and leukopenia also disappeared postoperatively, and the patient returned to her home on 13 December. She was well when re-examined on 9 June 1958.

Final diagnosis was fibrocystic disease, manifested by (1) pancreatic insufficiency; (2) biliary cirrhosis with associated portal hypertension, esophageal varices, and splenomegaly with hypersplenism; and (3) bronchiectasis and pulmonary emphysema.

Comment. Portal hypertension was proved by measurement of splenic pulp pressure in this patient who had only moderate-

sized varices, and no hepatomegaly or hepatic dysfunction. Patent splenic and portal veins were noted by splenoportography, thus assuring the surgeon of the presence of adequate sized veins with which to construct a portacaval anastomosis. The success of the portacaval anastomosis in relieving portal hypertension was well demonstrated by the repetition of splenoportography about three weeks postoperatively.

Case 3. This 7-year-old boy was adopted by American parents in Germany at the age of two and one-half years. Following adoption, hepatosplenomegaly was noted, and despite a rather detailed medical evaluation, a specific diagnosis could not be made. He remained asymptomatic and growth and development progressed normally during the next five years, although repeated medical check-ups usually demonstrated splenomegaly. Seven days before admission to a hospital there occurred slight fever, general malaise, and a sore throat followed by vague abdominal pains and failure of the patient to have his usual daily stool. The next day, after a laxative had been given, a black tarry stool was passed. The abdominal pains, constipation, and passage of tarry stools continued for six days before medical attention was sought. Because of rather marked anemia (hemoglobin, 5 grams per 100 ml), the patient was admitted to a hospital on 11 December 1957, given a transfusion, and transferred to this hospital two days later.

Physical examination demonstrated signs of anemia, slight hepatomegaly, moderate splenomegaly, abdominal distention with some ascites, and a tarry stool in the rectum.

Laboratory data included a hemoglobin of 7 grams per 100 ml, hematocrit of 20 ml per 100 ml, sulfobromophthalein sodium retention of 20 per cent at 45 minutes, and a total serum protein of 4.9 grams per 100 ml (albumin 2.7 grams per 100 ml). Total serum bilirubin, alkaline phosphatase, cephalin-cholesterol flocculation, thymol turbidity and serum electrolytes were all within normal limits. Radiographic study of the esophagus demonstrated varices.

During the first two weeks of hospitalization, the patient continued to bleed intermittently from esophageal varices, and 3,500 ml of blood replacement was necessary. Bleeding had stopped by 25 December 1957. Splenoportography was performed on 30 December and a cavernous transformation of the portal vein was found (figs. 3 and 4). Splenic pulp pressure was 460 mm of saline solution. Because of this evidence of portal hypertension secondary to extrahepatic portal vein obstruction, a splenorenal anastamosis was performed immediately after splenoportography. Pressure within the splenic vein was determined at operation to be 380 mm of saline, and this fell to 220 mm of saline after the shunt was completed.

Convalescence was uneventful, and the patient returned home 12 days after surgical intervention. He has had no recurrent hemorrhage to this date.

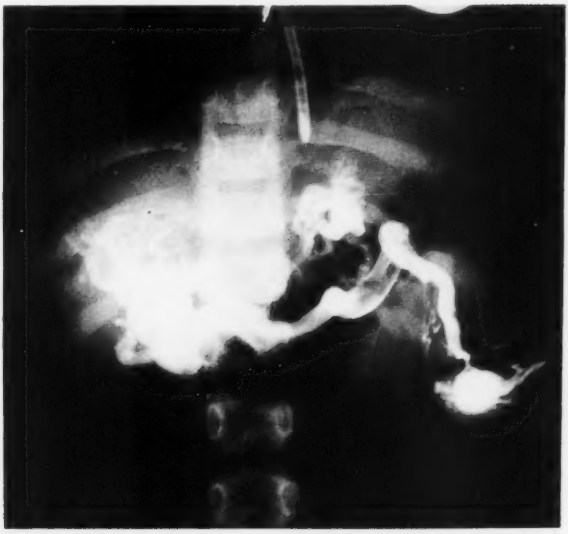

Figure 3 (case 3). Cavernous transformation of the portal vein. The splenic vein is tortuous and dilated, and the portal vein is replaced by multiple tortuous dilated collateral vessels. The coronary and short gastric veins end in a plexus about the stomach.

Figure 4 (case 3). Later film of same series as figure 3. Vessels ramify normally in the liver; large esophageal and gastric varices are filled with contrast material.

Comment. Again, it is noteworthy that only by splenoportography was the diagnosis of extrahepatic portal vein obstruction proved. The surgeon was thus directed to the proper operation after noting a patent, satisfactory splenic vein upon roentgenographic examination.

Case 4. A 46-year-old man began to use alcohol excessively in 1952, and was found to have liver disease in 1954 when he was hospitalized following a grand mal seizure. Development of erythematous, weeping lesions of his ears and face led to his hospitalization in 1957 after treatment with ammoniated mercury and cortisone ointment had failed. Anorexia, weight loss, and dyspnea had occurred during the month prior to hospitalization.

On admission to this hospital the patient's temperature was 101°F, his respirations were 28 per minute, and he was dyspneic and acutely ill. Erythematous, scaling lesions were present on his ears and over the beard area of his face. He had scleral icterus, and his liver was felt 5 cm below the right costal margin. A grade 2 systolic murmur was heard over the precordium.

His hemoglobin was 9.8 grams per 100 ml; hematocrit, 30 mg per 100 ml; white blood cell count, 7,700 per μl; total serum bilirubin, 4.5 mg per 100 ml; thymol turbidity, 2 units; cephalin-cholesterol flocculation, 3 plus; sulfobromophthalein sodium, 50 per cent retention in 45 minutes; serum albumin, 2.5 grams per 100 ml; and serum globulin, 3.6 grams per 100 ml. His stool was 3 plus for occult blood. Several lupus erythematosus preparations were negative.

The patient gradually became afebrile over the first two weeks. His stools became free of occult blood, and his hemoglobin became normal. Cardiac disease could not be demonstrated. Radiographic studies while swallowing barium and esophagoscopy showed esophageal varices, and a liver biopsy demonstrated Laennec's cirrhosis. Skin biopsy of the face revealed discoid lupus erythematosus which disappeared with chloroquine therapy, leaving residual atrophy and vitiligo. A splenoportogram showed a well-visualized splenic vein running a somewhat tortuous course, 8 to 9 mm wide, and a portal vein 7 cm long and 6 to 7 mm wide (fig. 5). Splenic pulp pressure was 226 mm saline solution. A repeat splenoportogram demonstrated the same configurations, and a splenic pulp pressure of 170 mm of saline. Because the portal and splenic veins were not dilated, and the portal pressure was within normal limits, no attempt was made to perform a portacaval shunt, and the patient was discharged to duty. At the time of discharge, his total serum bilirubin was 0.8 mg per 100 ml; thymol turbidity, 1 unit; cephalin-cholesterol flocculation, negative; alkaline phosphatase, 6.5 Bodansky units; and sulfobromophthalein sodium 20 per cent retention in 45 minutes.

Comment. Although this patient had all of the findings of Laennec's cirrhosis with associated esophageal varices, and appeared to have had portal hypertension at one time, splenic

pulp pressures on two separate occasions were normal. This would seem to indicate that natural collaterals sufficient to relieve his portal hypertension had developed.

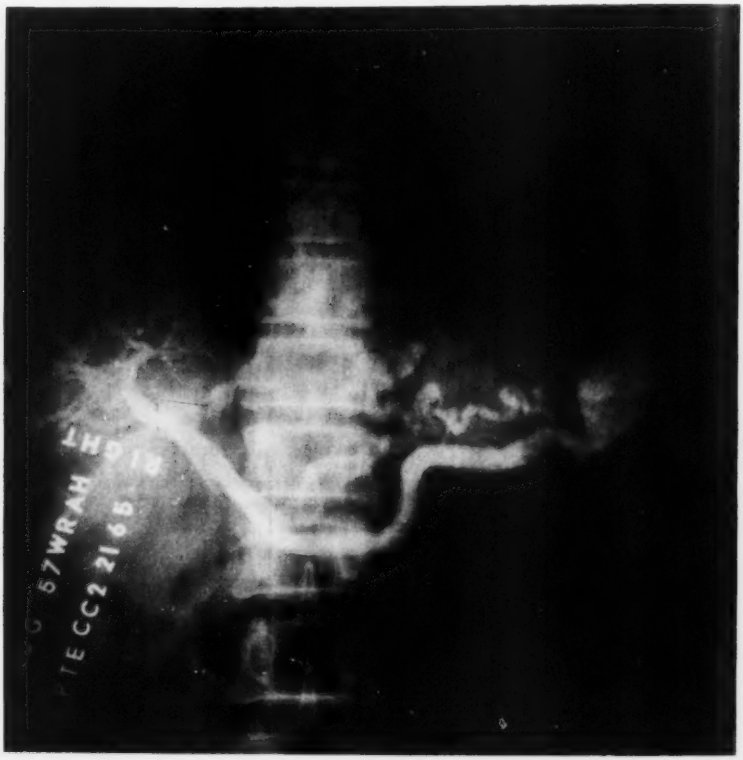

Figure 5 (case 4). Splenoportogram showing normal-sized splenic and portal veins, with some "streamlining" as a result of inflow of blood from the superior mesenteric vein. Coronary and short gastric veins, and esophageal varices are demonstrated.

Case 5. This 40-year-old nulliparous woman, with no significant alcoholic history, had a tooth extracted in September 1956. Local procaine anesthesia was used. During November and December she had anorexia and fatigue. She was admitted to another hospital in January 1957, and was found to have a slightly tender liver enlarged 7 cm below the right costal margin, spider angiomata, and scleral icterus. Her highest serum bilirubin was 9.7 mg per 100 ml; sulfobromophthalein sodium retention was 45 per cent; serum albumin, 3.0 grams per 100 ml; and serum globulin, 4.5 grams per 100 ml. During hospitalization ascites developed, and this was treated with mercurial diuretics, two paracenteses, several units of sodium-poor human albumin, and a low-sodium diet. In addition, a high-caloric diet and

supplemental vitamins were given. Initially, her hemoglobin was 8.8 grams per 100 ml, but this rose with iron therapy. Liver biopsy in February showed fatty infiltration, some fibrosis, but little cellular damage. The patient was discharged on a high-caloric diet and followed as an outpatient at that hospital. By August her sulfobromophthalein sodium retention was 22 per cent. In February 1958, after 10 days of melena associated with intermittent upper abdominal pain, she was admitted to this hospital.

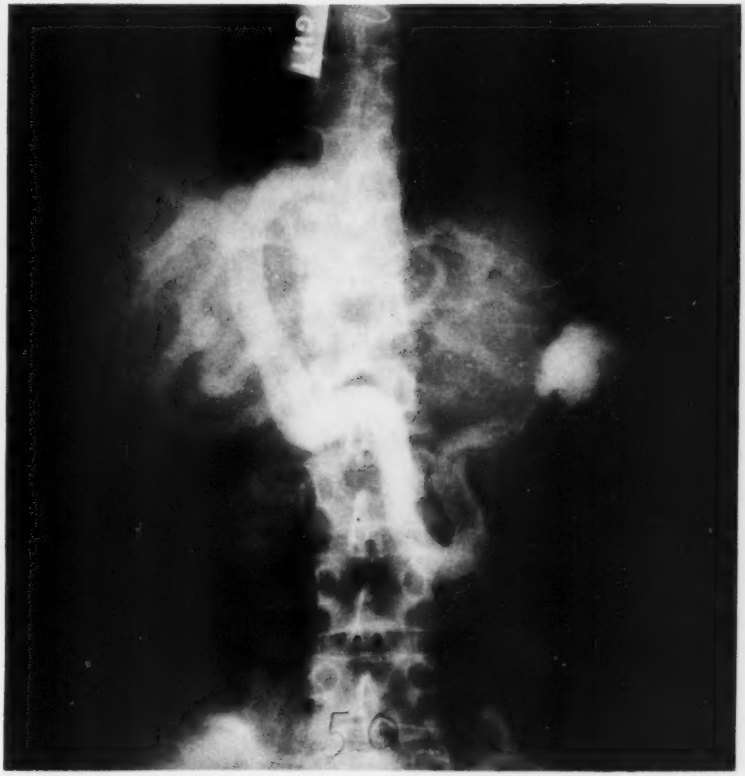

Figure 6 (case 5). The splenic and portal veins are dilated. Right and left branches of the portal vein are demonstrated.

Physical examination at this hospital revealed marked pallor, tachycardia, spider angiomata, scleral icterus, and a liver enlarged to 8 cm below the right costal margin. Laboratory studies on admission revealed a cephalin-cholesterol flocculation of 3 plus, normal thymol turbidity and alkaline phosphatase, an albumin of 2.6 grams per 100 ml and a globulin of 3.9 grams per 100 ml, a total serum bilirubin of 3.6 mg per 100 ml, and sulfobromophthalein sodium retention of 46 per cent.

The patient continued to bleed during the first four days of hospitalization, passing bright red blood on the fourth day with her hemoglobin falling to 6.0 grams per 100 ml. She required five pints of blood during this period.

Bleeding was controlled with a Sengstaken-Blakemore tube, kept in place for three days. Esophagoscopy, with the tube in place, showed large esophageal varices. Roentgenograms of the gastrointestinal tract did not reveal any other lesions. A liver biopsy showed portal cirrhosis with minimal fatty infiltration. Splenoportogram showed a very small splenic and portal vein, but finely ramifying collateral vessels were seen to arise from the coronary vein (fig. 6). The inferior mesenteric vein was small, tortuous, and displaced. Gastric and esophageal varices were visualized. Splenic pressure was 460 mm of saline solution. Three weeks later a portacaval shunt was performed. The portal vein was only 7 mm wide and the shunt was accomplished with difficulty. The initial pressure of 420 mm of saline only dropped to 350 mm. The patient tolerated the procedure well, but two weeks later ascites developed following massive hemorrhage. The bleeding was controlled by use of the Sengstaken-Blakemore tube.

Comment. In this patient, who was rather early in the course of her illness, the portal system dilatation and large collateral network usually associated with this degree of portal hypertension had not yet developed. A splenorenal anastomosis was considered but thought contraindicated, inasmuch as the splenic vein also was small and the majority of this patient's collaterals would be destroyed by such a procedure. Portacaval shunt did not produce sufficient reduction of portal pressure to prevent subsequent hemorrhage. Another attempt at surgical treatment of the varices seems indicated.

Case 6. This 46-year-old man with a history of alcoholism was found to have an enlarged liver in 1948. Massive hematemesis requiring transfusion with 11 pints of blood occurred in December 1955. Esophagoscopy showed esophageal varices, and a liver biopsy showed Laennec's cirrhosis. After a second episode of hematemesis in February 1956, a portacaval shunt was performed at this hospital. Esophagoscopy in December 1956 revealed no varices. In March 1957 he had six tarry stools, and four pints of blood were given. Small varices were found on esophagoscopy. Progressively worsening dyspnea and fatigability and the passage of two tarry stools led to his readmission in July 1957.

Physical examination revealed marked pallor, a systolic precordial murmur, tachycardia, a liver enlarged to 7 cm below the right costal margin, many spider angiomata, marked palmar erythema, and 2-plus ankle edema.

Laboratory data revealed a hemoglobin of 4.1 grams per 100 ml, which, with two pints of blood and intramuscular iron-dextran complex (Imferon), rose steadily to 9.5 grams per 100 ml with only one inter-

vening episode of melena. Total serum bilirubin was 2.8 mg per 100 ml and sulfobromophthalein sodium retention was 22 per cent. Serum albumin was 2.1 grams per 100 ml; serum globulin, 3.5 grams per 100 ml; cephalin-cholesterol flocculation, 3 plus in 48 hours; thymol turbidity, negative; alkaline phosphatase, 7.6 Bodansky units; and prothrombin time ranged from 45 to 65 per cent of normal. Liver biopsy again showed Laennec's cirrhosis. Radioscopy and radiography of the gastrointestinal tract showed no other lesions.

Esophagoscopy showed only minimal esophageal varices. No evidence of a hemolytic process could be found, and the anemia was ascribed to chronic blood loss. A splenoportogram in August showed good visualization of the splenic and portal veins with good filling of the inferior vena cava and no evidence of closure of the shunt (fig. 7). Splenic pulp pressure was 250 mm of saline. The patient continued to drink alcohol.

Figure 7 (case 6). Patent portacaval shunt in a patient with esophageal varices and gastrointestinal bleeding 18 months after operation.

He returned to this hospital in December with marked ascites, icterus, bleeding esophageal varices, hypoalbuminemia, and hepatic coma which eventually responded to vigorous therapy. Although he remains anemic, icteric, and collects fluid readily, he is again semi-

ambulatory and shows steady slow improvement on an outpatient regimen of sodium restriction, protein restriction (because of meat intoxication), diuretics, salt-poor human-albumin infusions, and parenteral iron therapy.

Comment. This patient's sudden downhill course could have been precipitated by either a thrombosis of the portacaval shunt with recurrent portal hypertension, and bleeding esophageal varices, or by progressive hepatic insufficiency hastened by gastrointestinal hemorrhage from some site other than esophageal varices. Splenoportography with manometry proved the portal venous pressure to be normal. Further surgical efforts to form vascular shunts do not seem indicated.

DISCUSSION

Radiographic visualization of the portal venous system by the injection of contrast material into a suitable vessel at the time of laparotomy has been performed since 1945.[1-4] This technic not only prolongs operating time and fails to provide for multiple serial films, but most important, it requires the surgeon to make his incision without knowing definitely on which side of the abdomen he will be operating. Portal vein visualization following intrasplenic injection at laparotomy was reported in 1951 by Pereira.[5] The percutaneous approach was used in experimental animals by Abeatici and Campi,[6] and in humans by Leger[7] and by Boulvin and associates.[8] Although the early reports came from continental Europe and England,[9,10] Blalock[11] in 1942 noted portal vein visualization, by accident, when he was injecting a sinus tract which entered the spleen. This led to the clinical use of percutaneous splenoportography at Johns Hopkins Hospital as early as 1949, but the results were not published until 1953. Many persons contributed technical improvements, and in 1954 Atkinson and Sherlock[12] demonstrated that manometric measurements in the splenic pulp gave an accurate appraisal of the portal vein pressure. It is now possible to detect portal hypertension, quantitate it, radiographically demonstrate its effect, and occasionally to determine its cause.

Other approaches to the portal venous system have been attempted. Percutaneous injection of contrast substance into an intrahepatic branch of the portal vein has been performed 144 times in 73 patients without serious complications.[13,14] The main portal vein, splenic vein, and collaterals are not demonstrated by this technic. The hepatic arterial and intrahepatic portal venous system also can be visualized by abdominal aortography.[15] Neither of these methods gives quite as much information as percutaneous splenoportography, and both seem somewhat more hazardous.

From 1953 through 1956, articles began appearing in the American literature and the technic spread slowly throughout

this country. Rodriguez, Gardner, and Diaz-Bonnet,[16] O'Sullivan and Evans,[17] Cooper and associates,[18] as well as Bahnson and co-workers[11] were responsible for this spread of enthusiasm. Further larger series of patients have been reported during the past year, and additional indications for splenoportography continue to appear.

DeWeese and associates[19] reported 134 splenoportograms on 120 patients in which 84.3 per cent were successfully completed. Serious splenic hemorrhage occurred in only one patient. Surgical intervention was not required. The prime value was in the evaluation of portal hypertension, the evaluation of portocaval shunts, and occasionally as an aid in the diagnosis of hepatic and pancreatic tumors. In only 17 cases were splenic pressures determined.

Turner, Sherlock, and Steiner[20] reported their results in the 126 venograms in 109 patients. Fourteen of these were failures. Splenic pulp pressures were taken as part of the procedure. Primary indications were gastrointestinal hemorrhage with suspected portal hypertension, undiagnosed hepatomegaly and splenomegaly, neuropsychiatric changes in patients with liver disease, suspected hepatic tumor, ascites of unknown cause, and postoperative investigation of portacaval anastomosis. A few patients were seen with large collateral vessels but without increased splenic pulp pressure. Occasionally, splenic pulp hypertension was noted without the presence of varices or other collaterals. Patients were followed in whom collaterals developed with a consequent loss of portal hypertension but with the occurrence of varices. Thus it was thought that bleeding esophageal varices could occur in the absence of portal hypertension and were not related solely to the latter. During 1957, Gilsanz, Vergara, and Estella[21] used percutaneous splenoportography in differentiating constrictive pericarditis from congestive hepatomegaly of other cardiac origin. The spleen-to-lung circulation time was measured with ether injected into the spleen in the same manner as, and compared with, the arm-to-lung circulation time. In two patients with constrictive pericarditis, there appeared an increased spleen-lung circulation time which was out of proportion to the arm-lung time, and with a markedly decreased visualization of the portal vein ramifications. These findings returned to normal after pericardiotomy.

While not a completely innocuous procedure, the relative safety of splenoportography becomes better documented each year. The danger of splenic hemorrhage remains, however, and 300 to 400 ml of blood in the peritoneal cavity has been noted on several occasions in patients coming to laparotomy for other reasons. Rarely has transfusion been necessary for clinical blood loss, and in only two reported cases[22] was emergency splenectomy required because of hemorrhage.

The success of splenoportography in producing adequate visualization of the portal venous system is well documented in the more recent and larger series. In the combined reports of DeWeese and associates[19] and Turner and co-workers[20] adequate visualization was obtained in 225 of 260 procedures (86.5 per cent). This excellent result demonstrates what may be expected from experienced operators. The main reasons for failure were (1) the inability to inject the dye into the spleen because of faulty needle placement; (2) subcapsular infiltration of the dye, even though the dye was injected into the spleen; and (3) technical failure of the radiographic equipment.

It is agreed that these patients should be hospitalized when the procedure is performed, and that a basic hematologic work-up, including bleeding time, clotting time, prothrombin time, platelet count, and complete hemogram, be performed prior to splenoportography. When a bleeding tendency is not correctable, splenoportography should be delayed until immediately preoperatively; any splenic bleeding can then be controlled while the abdomen is open.

It is our belief that splenoportography should be performed: (1) for the determination and measurement of portal hypertension; (2) to allow preoperative selection of the proper surgical shunt operation; (3) to properly evaluate the shunt function at later dates; and (4) as a diagnostic aid in the evaluation of hepatic tumors, obscure splenomegaly and ascites, congenital portal venous system anomalies, portal vein thrombosis, and gastrointestinal hemorrhage.

SUMMARY

Percutaneous splenoportography, combined with measurement of the hydrostatic pressure in the spleen, is safe, simple, and useful in evaluating the anatomy and function of the portal venous system. It provides an estimate of the degree of portal hypertension, and distinguishes between those patients who will benefit from a portacaval shunt and those who require a splenorenal shunt. Patency of portacaval shunts can be determined by its use.

Twenty-three patients were subjected to 30 such procedures. Satisfactory x-ray films were obtained for 20 patients, and pressure determinations were satisfactory in 20 patients. Useful information was obtained concerning each patient examined.

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RADIOGRAPHIC DIAGNOSIS OF ATHEROSCLEROSIS

BYRON G. BROGDON, *Captain, USAF (MC)*
NEIL E. CROW, *Captain, USAF (MC)*

ATHEROSCLEROSIS is among those pathologic conditions referred to as the degenerative diseases. It is not, however, limited in its occurrence to the "twilight years" of life. The coronary arteries of 300 American casualties of the Korean Conflict showed gross evidence of atherosclerosis, ranging from minimal change to complete occlusion in 77.3 per cent. The average age of these casualties was 22.1 years.[1] The "young coronary" victim has been well documented clinically and is familiar to all physicians.[2,3] Atherosclerotic occlusion of a large vessel such as the aorta may occur early in the fourth decade of life.[4]

Occlusive vascular disease is being intensively studied in many areas of investigation. Unfortunately, much of the knowledge thus accumulated is not yet thoroughly correlated for clinical application. The extent to which diet, familial tendency, exercise habits, stress, and other factors interrelate in the development of atherosclerosis is still controversial. The extensive investigation in progress undoubtedly will eventually provide many answers as to the future anticipation, diagnosis, and control of the disease. The opportunity to discover cases of unsuspected or subclinical atherosclerosis by incidental roentgen finding is most appealing and of tremendous potential benefit to the patient.

ROENTGEN DIAGNOSIS

The radiographic demonstration of atherosclerotic calcification is as conclusive in the diagnosis of the disease as is biopsy. The condition is rendered roentgen-demonstrable by deposition of calcium salts near the base of atheromata and deep in the intima where the process began. Typically, atherosclerotic calcification is dense, patchy, and plaque-like (fig. 1). These plaques may vary in appearance from small, rounded flecks of calcium to large, irregular calcific densities up to 2 cm in size.[5]

From U. S. Air Force Hospital, Parks Air Force Base, Calif. The authors are now assigned to U. S. Air Force Hospital, Lackland Air Force Base, Tex.

Figure 1. Typical atherosclerotic calcification of the abdominal aorta seen on a lateral view of the lumbosacral spine.

Atheromatous calcification must be differentiated from the calcification of muscular arteries seen in medial (Mönckeberg's) sclerosis (fig. 2). This latter calcification is typified by multiple concentric—but usually incomplete—rings or sheets of calcific density producing a trachea-like or gooseneck appearance. The radiographic demonstration of medial sclerosis is not significant in our present terms of reference as the disease is not occlusive. Medial calcification may, however, obscure coexistent atheromatous plaques.[5]

Atherosclerotic plaques must also be differentiated by location and appearance from calcification resulting from tumor, calculus, inflammation, and physiologic processes in adjacent soft tissues.

Calcified atheromatous plaques are most commonly visualized in the abdominal aorta and its branches, but may be demonstrated

Figure 2. Typical appearance of medial (Monckeberg's) sclerosis in pelvic arteries.

at many sites (carotid, cerebral, femoral, peripheral, et cetera). The aortic arch is apparently a relatively poor area for early radiographic demonstration of atheromatous disease.[6]

SIGNIFICANCE

The particular site at which a calcific plaque is visualized may be of little significance as an indication of local occlusion.[7] The demonstration of a plaque at any site is, conversely, of considerable importance as being a local indication of a widespread disease process, perhaps hitherto unsuspected.

Radiographically demonstrable calcification in atherosclerosis is not an early finding in the disease process. A review of x-ray studies of the lumbosacral spine and abdomen in 936 Air Force Academy and air cadet applicants disclosed no abnormal vascular calcification. Yet, in the Korean Conflict casualties previously cited, approximately three quarters of the men in this same age group had coronary atherosclerosis at autopsy.

Although not apparent early in the pathogenesis of the disease process, calcified atheromatous plaques may be visualized radiographically prior to clinical manifestation of the disease, and hence represent a significant finding. It is unusual to have clinically apparent occlusive disease of large arteries and not

have radiographically demonstrable arterial calcification in some region of the body.[4] Sixty-seven per cent of males with clinically evident peripheral atherosclerosis will have calcium in the atheromatous lesions.[5] In 21 men with proven occlusive coronary disease,[6] atheromatous calcification of the aorta or great vessels or both was visualized on films of the abdomen in 28.6 per cent. In a control series, the incidence was only 9.1 per cent (table 1).

TABLE 1. *Age of patients and incidence of roentgen-demonstrable atherosclerosis*

Group	Number of patients	Age range	Average age in years	Roentgen-demonstrable atherosclerosis in the abdomen	Incidence of roentgen-demonstrable atherosclerosis
Patients with coronary heart disease	21	35 to 44 inclusive	39.2	6	28.6 per cent
Neurosurgical patients with discogenic disease	22	35 to 44 inclusive	39	2	9.1 per cent

CLINICAL APPLICATION

The finding of arterial calcification in younger military personnel is of obvious importance in provoking further study. Its demonstration in individuals with critical or high performance job requirements would particularly demand extensive investigation and close follow-up. Because there is correlation between radiographically demonstrable atheromatous plaques and occlusive disease, a definite indication of atheroma should stimulate efforts toward early diagnosis of atherosclerosis.

In patients with clinically apparent disease, the observation of arterial calcification may provide the initial impetus toward definitive diagnosis. Carotid or cerebral arterial calcification may suggest the cause of transient neurologic disturbance (fig. 3). When examining the intravenous pyelogram one may note calcified hypogastric arteries as the significant diagnostic clue to the patient's difficulty. The physician who looks beyond the spine may discover calcification indicating vascular insufficiency as the cause of hip or leg pain (fig. 1). Each x-ray examination affords opportunity to diagnose the presence of atherosclerosis with certainty.

Thus the "radiologist"—be he such by training, designation, or default—has a responsibility to point out atherosclerosis

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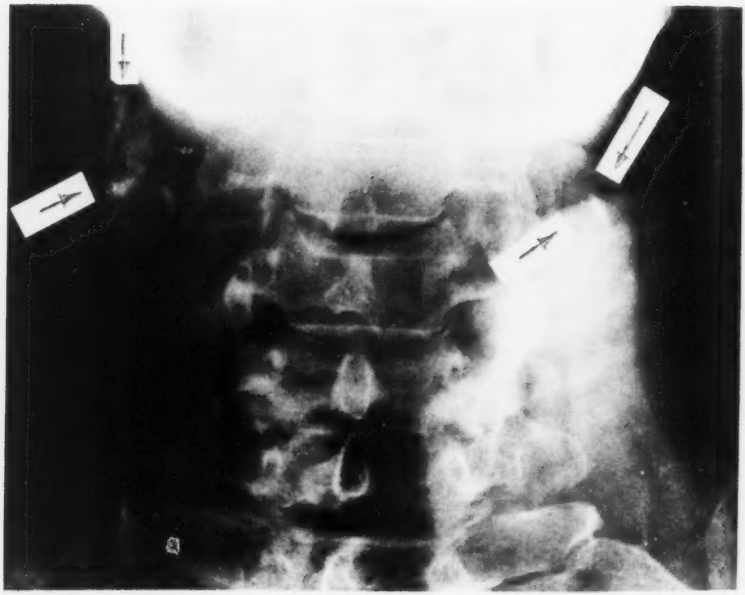

Figure 3. Atherosclerotic plaques in the carotid arteries bilaterally.

and its possible significance whenever encountered. Many cases may be detected before severe complications or even clinical symptoms arise.

INTERPRETATION

As atherosclerosis is a degenerative disease, determination of the age at which arterial plaques represent a significant radiographic finding is difficult and varies with the patient and the problem involved. It is our practice to make the finding of atherosclerotic disease the "high light" of the radiographic report in patients under 40 years of age. In the 40- to 50-year age group, the observation is given prominence in the report. In patients more than 50 years of age, the observation is presented as an incidental finding unless it is related to the condition that prompted the examination.

We do not propose the radiographic demonstration of atheromatous plaques as the final answer in early detection of atherosclerosis, but believe that its value as an additional investigative stimulant or diagnostic clue has been understressed and deserves emphasis.

We believe that roentgen-demonstrable atherosclerosis is a significant and poorly explored avenue in the over-all study of vascular disease. Such a concept is the result of impressions

gained from clinical observations, small control and clinical groups, and current literature. Admittedly, there are questions that remain unanswered at the present time because of lack of data—the prognostic significance of a single lesion, correlation and time relationship between demonstration of a lesion and subsequent vascular accident, et cetera. It is believed that the paucity of such data in the literature is related, first, to lack of investigation of this area, and second, to inherent difficulty in collecting large series of early atherosclerotic patients and obtaining long follow-up. It is our hope to stimulate awareness of the fact that radiographic diagnosis in atherosclerosis is not limited to study of the intrathoracic structures, and to emphasize the implications of other radiographic findings in the disease.

SUMMARY

The radiographic demonstration of atherosclerotic vascular calcification is always significant. As an indication of serious generalized disease, it is a sign that should be carefully sought on every roentgenologic examination. Its detection by radiography provides an excellent opportunity to study and treat subclinically affected individuals prior to the evolution of severe complications. In patients with clinical manifestations, the finding of atherosclerotic calcification may supply important diagnostic clues.

ACKNOWLEDGMENT: This paper represents one area of a broad investigation of cardiovascular disease conducted at this hospital under the direction of Col. James H. Hammond, USAF (MC). The authors are grateful to Dr. Hammond for his encouragement and assistance.

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THE DIAGNOSIS OF VIRAL ENCEPHALOMYELITIS

JAMES E. BANTA, *Lieutenant Commander, MC, USN*

NEUROTROPIC virus infection of the central nervous system usually results in a diffuse meningoencephalitis. This is often termed "aseptic" meningoencephalitis, because the spinal fluid is not purulent and bacteria are not recoverable. Such cases may present problems in differential diagnosis. When it is suspected that the illness may be caused by a virus, the attending physician assumes a responsibility for identification of the specific etiologic agent, inasmuch as most virus diseases involve groups of people and are, therefore, of public health significance.

Although specific diagnosis of virus diseases is not an easy task, advances in recent years have accelerated the procedure to the point where it now offers some assistance in differential diagnoses of the more acute disorders of the central nervous system. It is important that the physician understands the potentialities and limitations of the virology laboratory and keeps abreast of new developments in the field, if he is to obtain maximum help. Teamwork between the clinician and the virology laboratory is essential.[1-3] This article reviews virological diagnostic technics in current use, outlines the clinical material needed, and briefly discusses the value of the several technics in various virus infections.

CLINICAL MANIFESTATIONS

Since neurotropic virus infections tend to cause a diffuse meningoencephalitis, those manifestations suggestive of such diffuse involvement are of primary concern to the virologist. Symptoms and signs are headache, lethargy, chilliness, anorexia, nausea and vomiting, muscle pain, visual disturbances, sensory change, pyrexia, irritability, nuchal rigidity, somnolence, and abnormal reflexes.

If the clinical work-up of the patient and analysis of the cerebrospinal fluid indicate a diagnosis of aseptic meningoence-

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From U. S. Naval Medical Research Unit No. 3, Care of OP Nav-Op-92, Department of the Navy, Washington 25, D. C.

phalitis, then final etiologic diagnosis must be sought by the virology laboratory.

POSSIBLE ETIOLOGIC AGENTS

The number of infectious agents capable of producing aseptic meningoencephalitis is extensive, and must be considered by the virologist who wishes to establish a diagnosis.[4-6] Infectious agents considered to be possible causes of aseptic meningoencephalitis include:

Non-arthropod-borne encephalitides

1. Rabies
2. Lymphocytic choriomeningitis
3. Herpes simplex
4. Herpes zoster
5. Mumps
6. Measles
7. Infectious mononucleosis (?)

Enteroviruses

1. Poliomyelitis
2. Coxsackie—Group A
3. Coxsackie—Group B
4. Echo ("orphan") viruses

Arthropod-borne viruses

1. Japanese B encephalitis
2. Murray Valley encephalitis
3. Russian spring-summer encephalitis
4. St. Louis encephalitis
5. West Nile virus
6. Sindbis virus
7. Equine encephalomyelitis
   a. Western
   b. Eastern
   c. Venezuelan

Miscellaneous African Viruses

1. Semliki Forest
2. Ntaya
3. Uganda S
4. Bwamba
5. Zika
6. Bunyamwera, et cetera

Miscellaneous Infections

1. Leptospirosis
2. Toxoplasmosis

Epidemiologic circumstance will enable the laboratory to rule out a number of these agents, depending on the season and the geographic origin. In this age of rapid transportation, however, no agent should be excluded without consideration.

VIROLOGIC DIAGNOSTIC METHODS

The proper collection and preservation of specimens for laboratory examination is of paramount importance; and, if incorrectly done may preclude a diagnosis. Specimens are obtained for three principal purposes; (1) for primary isolation of the viral agent causing the infection, (2) for demonstration of a specific response in antibody titer, and (3) for histopathologic examination.

Inasmuch as immunologic examination of the blood serum is the most readily available and most satisfactory technic for establishing a diagnosis, it will be considered first. Blood must be obtained from the acutely ill patient as early as possible. A second sample of blood is obtained about 10 to 21 days after the onset of the disease and at least 8 days after the first sample. The blood must be obtained under sterile conditions, and permitted to clot at room temperature. After clotting, the specimen should be centrifuged and the serum separated and frozen. The frozen paired sera should be sent to the laboratory under refrigeration.[1,2]

A fourfold rise in the titer of specific antibody in the second specimen is highly indicative of infection and, in most instances, will establish a diagnosis. The virologist must have adequate clinical data in order to interpret the results properly; therefore, a record of the case work-up should accompany each specimen.

There are three principal immunologic tests available for demonstrating the presence of specific antibodies: (1) complement fixation, (2) hemagglutination inhibition, and (3) neutralization.

Complement Fixation

The complement fixation test depends upon the ability of a virus antigen and serum antibody to fix complement, thereby preventing fixation of the complement by hemolysin and sheep erythrocytes. The greater the dilution of serum which will prevent hemolysis of the sheep erythrocytes, the higher the titer of antibody present. As a rule the complement fixing antibody has a broader antigenic structure than the neutralizing antibody. The complement fixation test, therefore is usually less specific than the neutralization test. Except in lymphocytic choriomeningitis, the complement fixation test becomes positive later than the neutralization test, and reverts to negative much sooner than the neutralization test. Hence, a serum specimen which

possesses a high complement-fixing antibody titer is indicative, as a rule, of a recent infection and may have diagnostic significance.

Hemagglutination Inhibition

Hallauers[7] first reported hemagglutination of erythrocytes by neurotropic viruses in 1947. The subsequent work of Casals and Brown[8] established hemagglutination and hemagglutination inhibition as valuable tools in the investigation and classification of neurotropic viruses. The presence of specific antibody in serum may be demonstrated by its capacity to prevent the agglutination of human or chicken erythrocytes by various viruses. This is accomplished by the reaction of the antibody with the virus particle, destroying the viruses' ability to combine with the surface of the erythrocyte. The hemagglutinating antibody is less specific than the complement fixing antibody. It, however, has been very useful in studying the immunologic relationship of the various neurotropic viruses.

Neutralization

The neutralization test is the only test that measures specific antibody against the neurotropic viruses. Neutralizing antibodies usually appear in the circulation earlier than do other antibodies and often persist throughout life. The patient's serum is mixed with a known neurotropic virus. The antibody is then demonstrated by the inability of the virus to infect and kill the host; usually a white mouse, embryonated egg, or, more recently, cells in tissue culture. Because of its persistence, a high titer of neutralizing antibody is not indicative necessarily of a recent infection. It is necessary to demonstrate a rise in titer during the course of illness.

Isolation

In addition to demonstrating a rise in antibody titer an attempt may be made to isolate the virus. Possible specimens suspected of containing virus are blood, throat washings, stools, cerebrospinal fluid, and brain obtained at surgery or post mortem. Cerebrospinal fluid and blood are not usually very satisfactory for routine diagnostic isolation but, in certain cases, may be of value. Stools are a very important source of polio virus and the primary source of diagnostic material in this disease. In those patients who succumb to their disease, brain material obtained at autopsy is the primary source of neurotropic virus. Viruses from these various materials may be isolated by suitably preparing the material and inoculating it into appropriate laboratory hosts. Mumps, lymphocytic choriomeningitis, and herpes may be isolated in the embryonated egg. Most of the other neurotropic viral agents may be isolated by intracerebral inoculation of adult or suckling white mice (except poliomyelitis virus, types

I and III). Characteristic phenomenon occur in those mice having virus present. The sick mice are sacrificed when moribund, and brain and other tissues are harvested and reinoculated into mice. This process is repeated until the virus is well established. The virus is then classified immunologically for final identification.

Tissue Culture Technics

In recent years the employment of tissue culture technics for the isolation and study of neurotropic viruses has opened many new vistas, and most virology laboratories employ this tool extensively.[9, 10] It has been especially valuable in investigating the enteroviruses, particularly the poliomyelitis and Echo ("orphan") viruses.[11, 12] Poliomyelitis virus which has been studied most thoroughly to date, produces characteristic cytopathogenic lesions in cells of the HeLa strain of epidermoid cancer cells. Tissue culture can be used also to demonstrate the presence of neutralizing antibody in serum. If neutralizing antibody is present in serum the capacity of the virus to destroy the cell is inhibited; and, cellular degeneration does not occur. Cellular degeneration may be seen microscopically or may be demonstrated by the absence of pH change in the media; an indication of the disruption of cellular metabolism. Because of rapidity of diagnosis, ease of handling, and economy, tissue culture promises to become a progressively more important tool for isolating and studying neurotropic viruses.

SUMMARY

The virology laboratory has made available to the clinician technics for etiologic diagnoses of central nervous system virus disease. Generally the most useful tests are serologic because of their technical simplicity and because of their ability to demonstrate an antibody response in paired sera after about 10 days following the onset of illness. Usually primary isolation of the virus is more difficult and, as a result, diagnosis less rapidly established. However, the use of tissue culture has altered this in some respects. Tissue culture technics have greatly accelerated the diagnosis of certain neurotropic virus diseases, and the future undoubtedly will see an increase in the speed of diagnosis as well as in the spectrum of agents capable of being identified. By consulting the virologist early in suspected cases of aseptic meningoencephalitis, the physician and the patient, as well as medical science will benefit.

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"With few exceptions sicklemic individuals are unable to concentrate urine normally, although clinical tests of renal function yield no other evidence of impaired renal function. . . . Thus, the defect which is exhibited by sicklemic individuals is probably physiologic or metabolic in nature, rather than anatomic. Its presence does not depend on the simultaneous occurrence of anemia, but it is associated with the presence of sickle cell hemoglobin. It appears, therefore, to be inherited as part of the over-all picture of the sicklemic state."

—CHRIS J. D. ZARAFONETIS, M. D.;
JOHN D. McMASTER, M. D.;
LYNDALL MOLTHAN, M. D.;
and WILLIAM A. STEIGER, M. D.
in *American Journal of Medical Sciences*
pp. 80-82, July 1956

RESPIRATORY STUDIES IN PATIENTS BEING CONSIDERED FOR COMPENSATION

JAMES A. JERNIGAN, *Major, USAF (MC)*

MILITARY patients offer an unusual opportunity in the study of personal motivation as it relates to compensation for disability. This is true because patients who are considered not capable of performing unlimited military duty anywhere in the world are presented to a Physical Evaluation Board for evaluation and disposition. The patient is usually given financial compensation when he is discharged from the service because of a disability. In general, patients scheduled to meet a Physical Evaluation Board seem to have a greater tendency toward hypochondriasis and/or malingering than the other patients. This seems natural, for the more disability a patient has, the more money he gets in compensation. The relationship of this compensation factor to medical care is widely recognized. In a recent study of patients with acute low back sprain treated by conservative means, Krusen and and Ford[1] found that only 55.8 per cent of 272 patients eligible for compensation were rated "improved" at the time of discharge. This compared with 88.5 per cent of 237 patients not receiving compensation. Furthermore, the compensation cases required longer hospitalization and more frequent treatment than the other patients. There is an increasing need for information of this type, as the number of compensation cases in the military, in industry, and in the courts of law grow more numerous every day.

The study reported here was devised to evaluate motivation and certain psychologic tendencies in military patients eligible for compensation. Initially the study was to consist of testing with the maximum breathing capacity. Inasmuch as this test depends on ability to breathe at sustained high velocity, motivation to co-operate and perform well is important for a high result. Subsequent thought and consultation led to combining a carefully devised questionnaire on respiratory symptoms with the maximum breathing capacity test. In addition, the patients were given a modified Minnesota Multiphasic Personality Inquiry (MMPI) to evaluate hypochondriasis, hysteria, anxiety, faking, lying, defensiveness, and general attitude. Patients with dis-

From U. S. Air Force Hospital, Maxwell Air Force Base, Ala.

eases expected to produce respiratory symptoms or insufficiency and patients with psychiatric diagnoses were excluded. Thus, all patients would theoretically have no respiratory symptoms and a maximum breathing capacity in the normal range of the "predicted" maximum breathing capacity. Patients scheduled to return to duty served as the control group. This report deals with the methods, results, and conclusions of the study on the respiratory symptoms and the maximum breathing capacity revealed in the two groups. The results and conclusions of the other phase of this study are included in another report.[2]

METHODS AND MATERIALS

One hundred servicemen from the wards of the U. S. Air Force Hospital, Maxwell Air Force Base, Ala., were studied between August and November 1957. Fifty patients (hereafter referred to as Group A) were scheduled to meet the Physical Evaluation Board, and 50 patients (hereafter called Group B) were scheduled to return to duty. The patients were selected, with the consent of the patient's physician, to answer a psychologic questionnaire and to take a maximum breathing capacity test. Each serviceman studied had no sign of chest disease by physical and roentgenographic examination which would be expected to produce respiratory symptoms or impaired ventilation.

The patients were called to a special room, where a noncommissioned officer monitored the questionnaire. Twelve questions were related to respiratory symptoms. The patients were not told the purpose of the test, and inquiries about the test received nonspecific answers. After the questionnaire was completed, the patients returned to their wards. In a few hours to a few days the patients were called to another room where another noncommissioned officer conducted the maximum breathing capacity test. In this way an attempt was made to keep the patients from associating the questionnaire with the ventilation test. The personnel conducting the tests did not know whether a given patient was in Group A or in Group B. This served to increase the objectivity of the test. All patients in the study co-operated fully.

A Collins 13.5-liter respirometer was used to test the maximum breathing capacity. Resistance to air flow was reduced by removing the soda lime container and the valves inside the spirometer. The test was performed with the patient in the standing position. Patients were told and shown how to breathe deep and fast into the respirometer. There was a short practice period before the test was performed for 12-seconds. After additional instruction, if indicated, and three minutes' rest, the test was repeated. The better test was recorded. The "predicted" maximum breathing capacity was calculated according to the formula devised by Motley[3]: $\frac{(97 - \text{age})}{2} \times M^2$ BSA.

RESULTS

Figure 1 shows in graph form the response to questions on respiratory symptoms in each group. The 50 patients scheduled to meet the Physical Evaluation Board (Group A) gave a total of 168 positive answers to questions related to respiratory

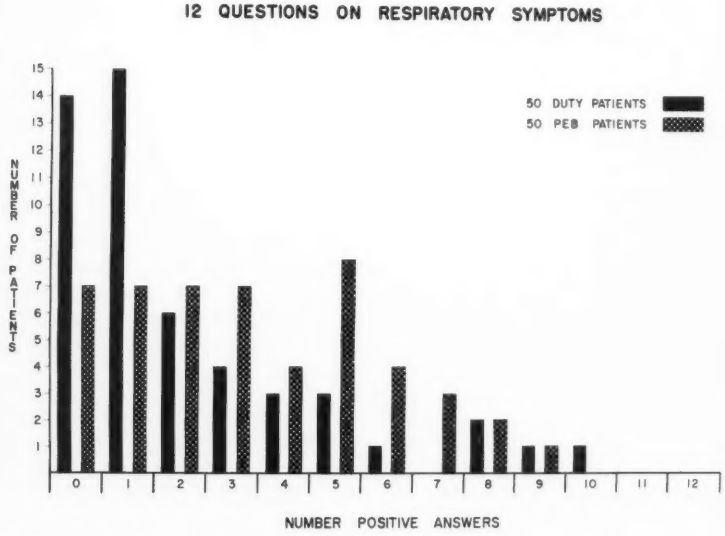

Figure 1. This graph indicates that the patients in Group A complained of more respiratory symptoms than the patients in Group B. The majority in Group A had three or more positive answers. The majority in Group B had zero or one positive answer.

symptoms, compared to 107 positive answers in the group returning to duty (Group B). It is noted that only 28 per cent of patients in Group A had 0 or 1 positive answer, compared with 58 per cent in Group B. This ratio is then reversed with the positive answers numbering 2 through 7. The patients in each group are the same on 8 and 9 positive answers. Out of 12 possible positive answers, only one answered as many as 10, and he was in Group B. There are individual exceptions, but in general, Group A had 57 per cent more respiratory symptoms than Group B.

The results of the maximum breathing capacity tests are charted in figure 2. In Group A, 38 per cent of the patients had a maximum breathing capacity less than 50 per cent of the predicted value, compared to only 14 per cent in Group B.

Eighteen per cent in Group A have a maximum breathing capacity that is 70 per cent or above the predicted value, compared with 34 per cent in Group B. The groups are about equal in the 50 to 69 per cent range. It is noted that not a single patient in

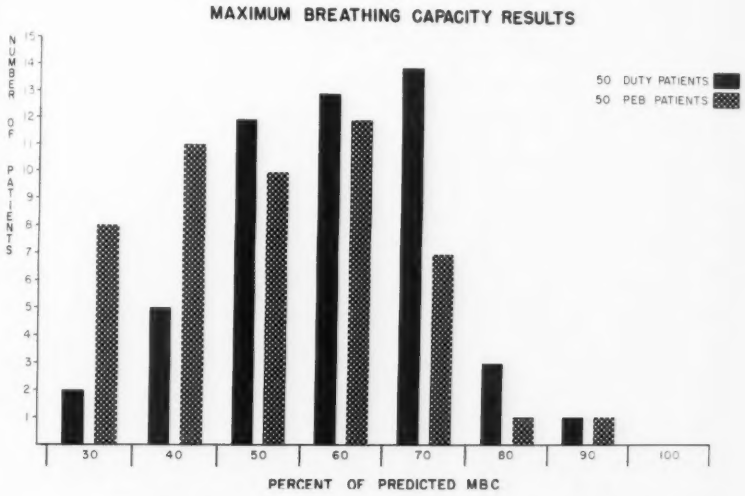

Figure 2. This graph shows a general tendency for patients in Group A to have a lower per cent of predicted maximum breathing capacity than patients in Group B. Each division represents a range of 10 percentile points, e. g., 30 to 39 per cent, 40 to 49 per cent, et cetera.

either group had 100 per cent of the predicted maximum breathing capacity. It is evident that the patients in Group B performed this test somewhat better than patients in Group A.

DISCUSSION

This study provides evidence to support the assumption that patients who may receive compensation for physical disability show more evidence of hypochondriasis than other patients. Neither the patients being considered for retirement from the Air Force for physical disability (Group A) nor the control patients returning to duty (Group B) were expected to have respiratory symptoms. Both groups were expected to have maximum breathing capacity tests in the normal range. Though patients in both groups had respiratory symptoms and showed values generally below the normal range of predicted maximum breathing capacity, patients in Group A complained more and performed more poorly on the ventilation test than patients in Group B. This trend is unequivocal.

The low values obtained on the maximum breathing capacity for both groups are probably due to two factors. First, the patients represent an average group of young and middle-age men who have maladies. The formula for the "predicted maximum breathing capacity" is based on results found in healthy students and other very healthy, strongly motivated people.[3] Even so, different technics and calculations used in different laboratories will produce results that vary as much as 32 per cent, and the standard deviation in a given laboratory may be 25 to 35 per cent.[4] The formula recommended by Motley and used in this study has a standard deviation of 13 per cent. As far as we know a significant study on the "norm" for patients without chest disease has not been made. It is possible, therefore, that the formula used to determine the per cent predicted maximum breathing capacity in these two groups is not applicable in patients who have no apparent embarrassment of ventilation. Second, the patients were not encouraged in a firm voice to breathe "deep and fast, deep and fast" as the test was being performed. The technic of letting the patient determine the rate and depth of respiration after proper instruction and demonstration has been recommended.[4-7] This technic was followed in the present study. Subsequent testing on normal subjects in this laboratory has shown that constant urging and pleading with "deep and fast, deep and fast" produces values about 25 per cent higher.[8] However, the extra effort exerted with the more vigorous technic would certainly be too much work for some patients. These two extremes in conducting the test indicate another problem in standardizing the maximum breathing capacity. Even though the factors mentioned above may account for the low maximum breathing capacity values, the factors were constant in both groups. Therefore, the relationship between the results in each group remains valid for the purpose of this study.

A logical sequence of this study would be to aid the physician in detecting the individual who has significant hypochondriacal or malingering qualities, This would be of value not only in the evaluation of compensation cases, but also in predicting the patients who might respond poorly to elective operations. Obviously, patients with diseases of the chest could not be included. A hypochondriac or malingerer in this study would be expected to have many respiratory symptoms and a low per cent predicted maximum breathing capacity. The patient who does not have these characteristics or one who is strongly motivated would be expected to have few or no respiratory symptoms and a high per cent predicted maximum breathing capacity. The term "motivation index" has been coined to express this quality in a patient. Using the respiratory symptom questionnaire and the per cent predicted maximum breathing capacity, one could devise a formula to represent the "motivation index" as a numerical value. A simple formula would be per

cent predicted maximum breathing capacity minus the number of positive answers on the respiratory questionnaire. Briefly stated, it is: Motivation Index = % (P) MBC - Respiratory Symptoms (S), or: MI = % (P) MBC - S.

When this formula is applied to the findings of each patient in Group A and Group B, the distribution is as charted in figure 3. According to the assumptions made, the hypochondriac, malingerer, or poorly motivated patient would have a low score.

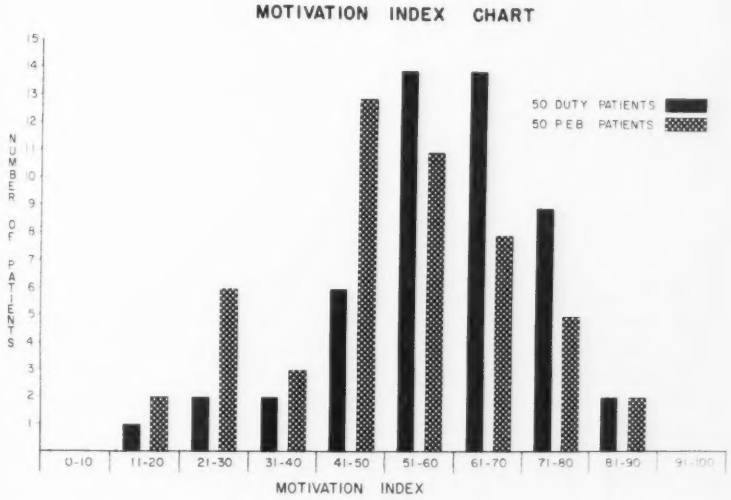

Figure 3. This graph shows that patients in Group A tend to have a lower "motivation index" than patients in Group B.

A well-motivated patient would have a high score. Forty-eight per cent of the patients in Group A have a score of 50 or less, compared to only 22 per cent of patients in Group B. This ratio is reversed at the higher level. Thus, patients in this study going to a Physical Evaluation Board are more than twice as likely to have a low "motivation index," as defined here, as are patients returning to duty. It is obvious that there is considerable overlapping in the groups.

This type of calculation, using respiratory symptoms and a ventilation test to produce a numerical value defining motivation, may be considered an invasion of the art of medicine. Some may believe it is an attempt to substitute "mechano-medicine" for the observation at the bedside or the careful description of psychosomatic factors. On the contrary, this approach is an attempt to supplement the methods available which aid in defining certain intangible characteristics in patients.

Several problems developed in the course of this study which were not anticipated in the original research plan. Six patients in Group A were eventually returned to duty without meeting a Physical Evaluation Board, and eight patients in Group B were sent to the Physical Evaluation Board. At the time of the test, however, the patients were aware of their probable disposition as reflected in this study. Nevertheless, future study must be done when the disposition is certain. Secondly, some of the answers referring to the respiratory symptoms may have been affected by a medical problem that was unrelated to the lungs. However, it is very difficult to devise questions that would refer only to the lungs and chest. Thirdly, a more positive correlation might be expected if the patients were aware of the purpose of testing and if the time internal between the two tests were short. These problems must be considered in the plans for future investigation.

CONCLUSIONS

The deficiencies of this testing procedure include all the problems that are acknowledged to make psychologic questioning and pulmonary ventilation tests of limited value. However, the use of an adequate number of control patients will nullify these objections in a study of this type. The formula which offers the "motivation index" is not clinically applicable now. More patients must be studied, and adjustments must be made in the testing technic. Further investigation along this approach does seem warranted, for assumptions on the symptoms and behavior of patients considered for compensation have been supported.

SUMMARY

One hundred military patients have been studied to evaluate motivation and the tendency to hypochondriasis in compensation cases. A combination test was employed which consisted of a questionnaire on respiratory symptoms and the maximum breathing capacity. All patients had normal chests and no significant emotional illness. Fifty patients were scheduled to appear before the Physical Evaluation Board and 50 patients were scheduled to be returned to duty.

In general, the patients returning to duty had fewer respiratory symptoms and higher results in the maximum breathing capacity than the patients who were potential compensation cases. There were exceptions to this trend in both groups.

A reliable test of motivation or tendency to hypochondriasis would be of value to physicians who are concerned with compensation cases. Such a test would also be helpful to a surgeon evaluating a candidate for an elective procedure. Interesting speculation is presented on a method to determine the "motivation index," using information gained in this study. The

limitations of this information and the need for further investigation are discussed.

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"BENEFICIENT STRESS" IN RETIREMENT

"Even though we may have retired from our jobs, each of us needs something to do that is purposeful and constructive. We live in a society that emphasizes that man's role is a creative and constructive one. Most of us have worked steadily and industriously in a society that respects only the productive. We have become accustomed to a certain amount of stress. This is the vital elixir of life. Regardless of age, it is essential in the proper dosage to the maintenance of health and happiness. The stress that has stimulated us in our lifework must be replaced in retirement by the use of the "beneficent stress" that comes from new pursuits—vocational, avocational, educational, cultural, and recreational. There is an adage "action absorbs anxiety." Applied to the individual who is preparing to retire, purposeful activity under the ceiling of stress not only absorbs anxiety but also prevents both physical and emotional deterioration."

—HOWARD A. RUSK, M. D.
EUGENE J. TAYLOR, M. A.
in *Journal of Chronic Diseases*
p. 446, May 1958

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THE HOWARD-BAILEY TOURNIQUET

STERLING J. RITCHEY, *Colonel, MC, USA*

THE Howard-Bailey pneumatic tourniquet has proved so successful at this installation that dissemination of information concerning this unique but simple device seems justified.

Dr. Lot Howard of San Francisco, Calif., demonstrated this tourniquet at the "Gadget Exhibit" during the meeting of the American Academy of Orthopaedic Surgery in 1956. Its simplicity, reliability, and economy prompted its construction and testing here. With minor variations from the original, this tourniquet has been used in the operating rooms at this hospital exclusively for over one year with amazing freedom from technical application errors and mechanical failures.

DESCRIPTION

The arm tourniquet consists of a blood-pressure cuff, or other pneumatic arm cuff, enclosed in its removable cloth sheath or sewed into a strong cloth cover. The cuff cover is sewn at its edges to a strip of flexible metal fireplace screen, which is the size of the cuff itself. The arm cuff (fig. 1) measures 23 by 3½ inches, and this size seems ideal for adult arms and as a leg tourniquet for small children. The leg cuff measures 31 by 3½ inches, is constructed in the same manner, and utilizes a commercial leg tourniquet rubber bladder. The hook is formed of spring steel wire, 0.105 inch in diameter.

Another, a child's size, 16 by 3½ inches, is occasionally used. Any two tourniquets can be hooked together for the very large extremity. The tube outlets of the tourniquet bladder are cut off and "cold-patched" with automobile tube patches. A replacement valve stem is cold-patched to the center of the bladder as a loading and deflation valve.

The tourniquet simply is applied in one step, with the firm application of the cuff about the extremity and the free hooks catching in any coil (fig. 2). No additional bandage support is required. The tourniquet is inflated in the same manner as an automobile tire, with the application of the loading nipple at a predetermined pressure. The loading tip, the replacement valve

From Walter Reed Army Hospital, Walter Reed Army Medical Center, Washington, D. C.

stems, and the cold-patching sets are available at a nominal cost at any filling station or automotive supply store.

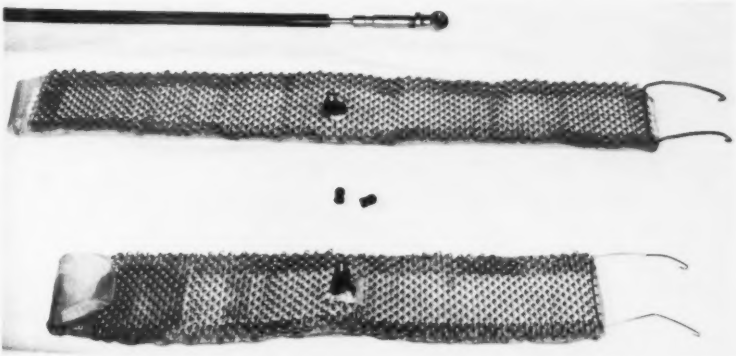

Figure 1. Two sizes of cuff with valve stems and the loading tip.

Figure 2. Tourniquet in place and method of applying loading tip to valve stand.

A simple movable upright is fashioned to hold a "D" tank (95 gallons) of compressed gas or air with standard connections (fig. 3). This tank connects beyond its cut-off valve to an ordinary welder's gage. The gage is an adjustable pressure reduction valve, the first dial gage recording tank pressure (when the tank valve is open), and the second dial being replaced by a regular tourniquet pressure gage. This second gage then records the adjusted pressure in the delivery tube and also in the tourniquet when inflated. The ordinary tourniquet pressure gage, as

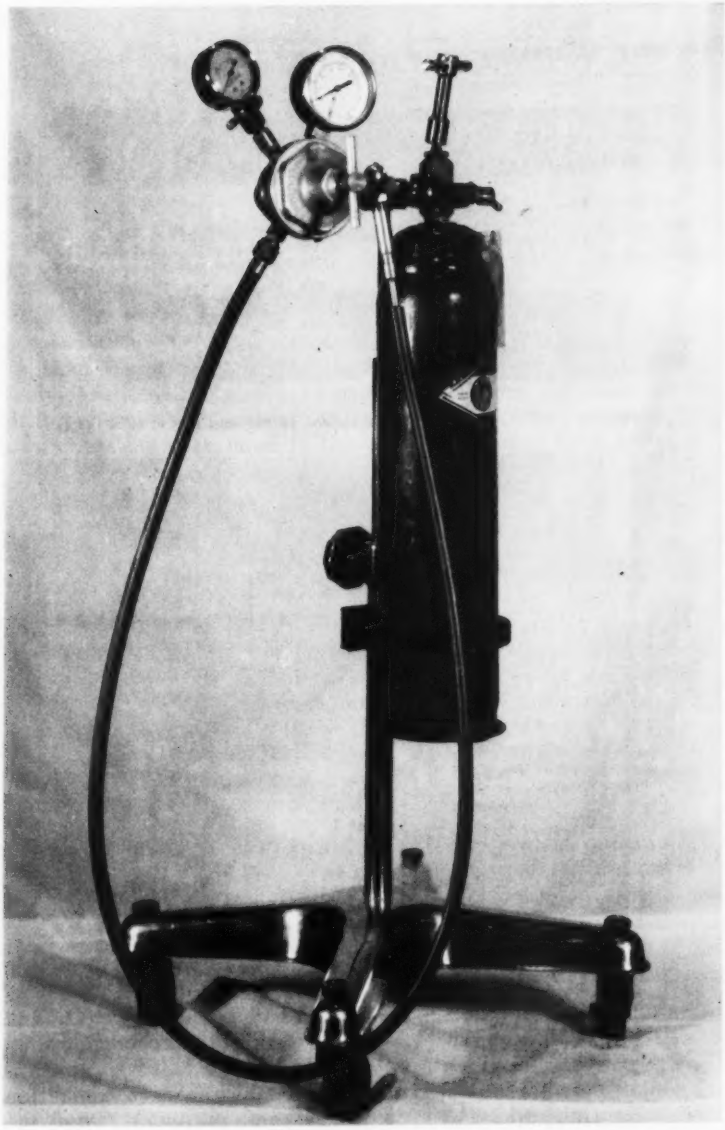

Figure 3. Gas tank and stand. Tank pressure gage, tourniquet pressure gage, reduction valve, and loading tip.

illustrated, is calibrated in millimeters of mercury, the type familiar to surgeons. If pounds per square inch (p. s. i.) valves are used, which then would eliminate replacement of the second pressure gage, a simple conversion formula may be used: p. s. i. x 50 equal mm Hg. Thus 6 p. s. i. equal 300 mm Hg for arm pressure; 12 p. s. i. equal 600 mm Hg for leg pressure. The tourniquet pressure desired is adjusted before the tourniquet is inflated. One quick loading application is required, and the stem cap is then replaced.

The tourniquet loading tank is portable. One tank is adequate in an operating suite of many rooms, and in a medical facility of this size, two cuffs of each size have proved to be adequate.

Extended tubing from the cuff is not recommended, inasmuch as these tubes are the usual source of leakage. Ordinary oxygen "D" tanks carrying 1,700 p. s. i. pressure are used, because they are more economical than compressed air tanks. There is no explosion hazard from the use of oxygen in this manner.

The tourniquet is extremely comfortable because of its broad steel mesh support, and it is much more simple to apply than are other types. In over one year of continuous use at this hospital, it has proved to be economical as well as completely reliable and trouble-free.

PUSH BUTTON SATELLITES

"In 1946 an American physicist, Louis Ridenour, published in *Fortune* a whimsical but prophetic piece. He saw the earth surrounded by a swarm of atom bomb-carrying satellites, owned by various nations. By pressing the proper button, one of these deadly moons could be made to drop on a target anywhere in the world. In well-protected underground operation centers, the military of every nation were keeping day and night watch, with their eyes glued to radar screens and their fingers on the fateful switches. An earthquake in California, a misinterpretation of the blip it produced on the radar screen, a snap decision of an overwrought officer—and the rain of atomic satellites began to fall upon the cities of the world, as one nation after another was drawn into the deadly chain of 'massive retaliation.'"

—EUGENE RABINOWITCH
in *Bulletin of the Atomic Scientists*
p. 350, Dec. 1957

SERVICE ARTICLE

INDIVIDUALIZED RELIEF SERVICES FOR THE CIVIL WAR SOLDIER AND CURRENT SOCIAL WORK PRACTICE

FERNANDO G. TORGERSON, *Major, MSC, USA*

IT is easy to become diverted and to fall victim to the tendency to exploit the dramatic and spectacular when studying any aspect of the Civil War period. That it was a fascinating, colorful period of history is readily apparent in the incredible amount of historical material available to the researcher; for example, the entire bookstores which deal only with books on Lincoln, and Douglas Southall Freeman's[1] monumental *Lee's Lieutenants* with its staggering documentation.

This article spotlights a single phase of the Civil War period—a small part of a larger movement, which in turn was a part of still larger movements. This particular phase of the Civil War period comprises the charitable activities related to the social and economic problems of sick and wounded soldiers and their relatives. Specifically, the article is centered about the hospital visitor program sponsored by the Special Relief Department of the United States Sanitary Commission during the period 1861 to 1865, and its relationship to modern military clinical social work as the earliest recognizable expression of an activity identified today as social casework.

Because the flowery language characteristic of the Civil War period requires special attention to semantics, quotations are employed to a far greater extent than would ordinarily be desirable so that the reader can determine for himself whether the material has been interpreted fairly and accurately. Extensive quotation is also indicated because of the nature of the study. The comparison of an activity unique to the American Civil War with an activity identified today as social casework involves a judgment concerning professional goals, philosophy, concepts, principles, and methodology. Inasmuch as none of these is entirely objective, the reader can use the numerous quotations to verify for himself the conclusions reached in this article.

From Army Medical Service School, Brooke Army Medical Center, Fort Sam Houston, Tex.

INTRODUCTION

The fall of Fort Sumter in April of 1861 gave birth in the North to a burst of human activity that can hardly be imagined. Within three days over $1,000,000 was spent on flags. More would have been spent, but the supply was exhausted. Every available piece of red, white, or blue bunting was snapped up almost overnight and made into dresses, bows, or other ornamentation. States that were asked to provide one regiment responded with ten. Men, jammed into cattle cars, stood without food or water for 36 hours in a frenzied rush to the defense of Washington. An avalanche of bandages, lint, clothing, and food crowded every rail center in the North. Ladies' Aid Societies were organized overnight. Bands played, bells rang, and bars never closed in that first burst of patriotic fervor.

Lincoln had asked for 75,000 volunteers, and in less than two weeks 350,000 were organized into crude, motley, unarmed bands of fevered men. The National Government was ill prepared for anything like the organization and direction necessary for this scale of activity.

The Regular Army numbered only 17,000. They were scattered out on the frontiers as far away as California. How were they to organize, train, and lead a volunteer army that outnumbered them more than 20 to 1? This was no orderly, regulated induction. One day they numbered 17,000—two weeks later, 365,000.

Medical care for the peacetime Army was organized into a Medical Bureau totally unprepared for mobilization. Preventive medicine was almost unknown to the Army, which also lacked facilities, a hospital system, and even a semblance of an evacuation plan. In brief, they were set for garrison medicine, not for field medicine.

And now thousands of inadequately equipped, undisciplined, but enthusiastic, volunteers came tumbling into makeshift camps having almost no sanitary provisions. The fatigue, the malnourishment, the unaccustomed exposure to the elements, the indiscriminate billeting of persons from all points of the union, the flies, and the latrines combined to lay half of the troops low with fever, diarrhea, dysentery, and malaise.

The "home folks" were not long kept ignorant of the fact that "their boys" were in a bad way and that their government was inadequate to handle the situation with the dispatch necessary. Letters home intensified the activities of fathers, mothers, sisters, and sweethearts to a level of motor activity that can only be appreciated by the results obtained. A noted historian of the period, Emerson David Fite,[2] was of the opinion that never before in the history of the United States had such great charity existed.

From strait-laced tranquillity and unbending propriety, young ladies became strenuous volunteers.

> Everywhere the sewing machines were driven at their utmost speed and paused not even for the rest of the Sabbath, in preparing needful articles of clothing, and needle-women, scarcely less swift in their labors of love, worked till the gray dawn streaked the East and after the briefest possible interval of rest, returned anew to their toil. . . .While everywhere. . .fair brows grew grave with thought of what could be done for those who were going forth to fight the nation's battles.[3]

Even the divines were stirred. A Parson Brownlow declared, "We are ready to fight for this flag till Hell freezes over, and then we'll fight on the ice."

This then was the virile, strenuous response of a people, a people marked by self-righteous morality, distinguishable by their worship of God, work and cleanliness, captivated by the love of hyperbole, enamored of the sententious and flowery phrase, preoccupied with thoughts of death, and given to black suits, black hats, black dresses, and black shoes. "Hark from the tombs a doleful sound" conveys as well as a phrase can the temper of the time just prior to the outbreak of war.

THE UNITED STATES SANITARY COMMISSION

There are few more inspiring stories in our history than that of the growth and development of the United States Sanitary Commission. After reading the account of its origin and subsequent success, one is struck by the fact that it is so little known.

It was no "indiscriminate holiday scramble of Good Samaritanism."[4] It grew out of what was initially an irrepressible wave of national ardor, good will, and self-sacrifice at first motivated by the call to arms, but later by the accounts of the frightful suffering of the troops in camps even before a shot was fired.

The first charitable efforts of the Nation were guided by nothing more than common sense. If the troops were starving, send food. And send food they did. Mountains of it stacked up at railroad terminals and rotted in the summer sun. If they were in need of clothes, then send clothes. And all kinds of garments clogged the overtaxed supply lines. If medicines were needed, send medicines. If tender loving care was needed, then go and join the troops.

All of these things happened before the government could stem the tide of charity which was literally inundating the Washington area.

When word of the chaos resulting from the spirited and well-intended efforts of the people got back to them, they promptly

introduced sound method and system to their work. Ladies' Aid Societies carefully planned ways for determining need, distributing work, raising funds, corresponding with the National authorities, and bringing general order and co-ordination to the home forces.

Among the first Ladies' Aid Societies was the Women's Central Association of Relief of New York City. Organized in April 1861, it assumed leadership in impressing upon the Federal Government the need for a more effective program for the care of sick soldiers. They carried on an extensive correspondence with other societies, urging them to pummel the government with letters demanding action. In its membership were ladies from the leading families of New York City, who succeeded in getting a number of doctors, ministers, and other influential laymen to petition the President. On 18 May 1861, a petition reached President Lincoln asking him to organize or encourage the organization of a commission, composed of civilian and military leaders, to be "charged with the duty of methodizing and reducing to practical service the already active but undirected benevolence of the people. . .for. . .the comfort, security and health of the Army."[3]

The President and the Secretary of War did not at first look with favor on the proposed plan which they regarded as a sentimental scheme "concocted by women, clergymen and humane physicians." Only the earnestness of its advocates, their high position, and the support of the Acting Surgeon General of the Army dissuaded them.

Accordingly, on 9 June 1861, the President approved a commission called The Commission of Inquiry and Advice in Respect of the Sanitary Interests of the United States Forces and later changed to The United States Sanitary Commission (USSC).

It was composed of some 500 doctors, clergymen, professors, Army officers, and other interested citizens. Its mission was seen as largely medical and nursing, but they had as an additional objective "whatever else relates to the care, relief, or cure of the sick and wounded. . ."

The USSC was a civilian commission with Presidential approval to inspect Army facilities and make recommendations. It had no executive functions within the Government structure. As to relief of the sick and wounded, it was intended to support, not supplant the Army Medical Bureau (later changed to Medical Department).

It is not necessary to go into the functions of the USSC except to make clear its broad purposes and pattern of functioning. At the request of the Army, it met service and material needs as they became apparent, and it co-ordinated the philanthropic efforts of the nation.

SPECIAL RELIEF DEPARTMENT OF THE USSC

In the early reports of USSC activities there is no mention of what today would be referred to as social casework. The very detailed "Camp Inspection Return Form," which covered everything from bedbugs to drunkenness, makes no reference to individualized charitable activities. Inspection returns, during July 1861, on the hospitals around Washington, D. C., make no mention or recommendations which can be interpreted as coming within the broad area of what we now consider medical social work.[5]

In time, however, special or individual needs became evident. Mr. Fredrick N. Knapp was designated Special Relief Agent. In his first report,[6] 23 September 1861, he spoke of providing "aid and comfort" to sick soldiers passing through Washington. This help was individualized and given with sympathy, understanding, and "good cheer."

J. S. Newberry, head of the USSC in the Western Department, gave this explanation for the establishment of a Special Relief Department:

> . . .early in the history of the war, many unexpected and, as we at first supposed, exceptional cases claimed our sympathy and effort, while suffering from one or another of the thousand hardships or misfortunes which are the legitimate fruit of every system coined by finite and imperfect men.[7]

Thus there grew up under the leadership of Mr. Knapp (a clergyman) a program of service for sick soldiers who were in transit from one hospital to another or on their way out of the service as a result of wounds or illness. These services included: transportation arrangements, aid in correcting soldiers' papers, getting back pay, "recovering them their positions when they have been wrongly set down as deserters and saving them from sharpers," and, as the war progressed, aid in procuring "pensions and bounties." All of this was aimed toward "the relief of that most terrible mental anguish, the torture of dread uncertainty."[3]

The Special Relief Department also looked toward "rendering the sick soldier content" by providing care for his family. This was achieved through material assistance, advice, health and welfare reports, and through the establishment of a directory service listing sick and wounded soldiers and their location.

Typically Special Relief Department services were rendered from "Soldiers' Homes" which were in actuality facilities for transient soldiers. These services were not rendered in relation to medical conditions. They were meeting social needs of sick and injured soldiers but not in a medical setting; any medical care needed was secondary. It cannot be considered as entirely analogous to present-day medical social casework. But the

important thing to recognize here is that need was recognized and met on an individual basis.

The Special Relief Department agents exhibited a concern for the individual and a philosophy of help that comes close to the underlying social policy of today which manifests itself as social casework. Special Relief Agent Fredrick N. Knapp's third report, 21 March 1862, says of their mission of providing "aid and comfort:"

> It is something more than bestowing food and clothing or alleviating pain-it is relieving a mental anxiety. . .what a vast amount there is in the hearts of these soldiers of personal sacrifice, daily struggle to put down anxious feeling which might enervate the man. . .the sum and costliness of all this can never be estimated.[8]

This was not merely a conviction or a belief; it was transformed into a program of services. Mr. Knapp, in the report cited above said of one of these early workers, a Mr. Rogers: "His judicious advice or timely direction or helping hand has saved men from anxiety. . .or real suffering." These individualized services are described as taking from 30 minutes to a half day "and the aggregate of all the pain saved has been greater than any person not cognizant of the variety and the number of these calls could estimate."[8]

Others, like Mr. Rogers, who worked in the soldiers' homes, found that "to unite tender kindness and cordial welcome with the exercise of a discriminating judgment, and often stern authority, is not easy, in our Special Relief work the presence of the one does not exclude the working of the other, and that not the soldier only, but the Army is stronger because of the 'home'."[9]

A number of typical case recordings of these soldiers' home "caseworkers" appear in Report No. 77 of the USSC. These recordings, probably among the first, read like a typical record from a present-day relief agency. The "caseworker" of that day was required to have a knowledge of community resources. That he made referrals is revealed by this comment appearing in the same report: "This work has consisted in judiciously assigning the applicant for aid to such existing Relief Associations in the city as his case pointed to."[9]

The Special Relief Department marked the first step within the USSC to provide individualized social service for the incapacitated of the Union Army. But as the Army increased its capability for handling sick and wounded, opportunities began to present themselves to reach sick and wounded soldiers in the hospital, where they were one echelon closer to the battlefield.

A partial understanding of the principles underlying the practice of the Special Relief agents can be gained by a review of

their thinking with reference to the disabled veteran. Because this permits a comparison of their principles with those of today, extracts from official reports of the USSC are quoted below:

> You who have paid so much attention to social science, know how easily loose, indulgent, and destructive notions creep into communities under the name and purpose of humanity, and what temptations of a sentimental kind there will be, to favor a policy which will undermine self-respect, self-support, and the true American pride of personal independence.[10]

To guard against these dangers they offered the following guide lines.

1. As little outside interference with natural laws and self-help as possible.
2. As much moral and other encouragement and strengthening of the natural reliances as possible.
3. The utmost endeavor to promote the healthy absorption of the invalid class into the homes, and into the ordinary industry of the country.

They were strongly in favor of permitting the soldier's family to help to the maximum extent possible. This was more from a conviction of its "intrinsic" value than any attempt to avoid state or national responsibility. They thought an intangible value was to be gained from the family caring for its own.

Consequently, they discouraged "soldiers' homes" because they were not in the soldiers' best interests. It unnecessarily and harmfully separated him from his home and his community, which resulted in loss of interest and subsequent deterioration.

The local community should absorb the returning disabled soldier with as little fuss as possible. Avoid at all costs making the soldier feel different or special.

Pensions, when necessary, should be free "of all humiliating or enslaving character." They should be a forthright expression of the nation's debt to the soldiers, devoid of sentimentality.

For the "floater" who had no home, they urged *national* institutions on the grounds that it was a national problem growing out of a national struggle. They feared, if left to the states, it would become a political issue with "soldiers' homes" degenerating into "poorhouses," something to be avoided at all costs.

One is obliged to concede that much of this philosophy of help is in harmony with current progressive thinking.

As was characteristic of the USSC, they translated their philosophy into action. The Bureau of Information and Employment was created 14 June 1865 to follow through in providing help for discharged soldiers with all manner of problems as-

sociated with their return to civilian life. Every soldier who came to them for help, according to Mr. Knapp, was given "a patient hearing and kindly explanation. . .and friendly personal regard,"[11] whether an honored hero or a deserter.

In this last we see evidence, again, of their profound regard for the individual and their conviction that all people are worthwhile.

THE HOSPITAL VISITOR

> In its first organization, the measures of relief adopted by the Sanitary Commission were framed like those of Government, for the benefit of masses rather than for individual cases, but, while these as a whole accomplished the objects hoped for, it was found that many individual cases would creep through its net, and, for want of special attention and peculiar adaptation of means of relief, would still be left to suffer. It was found, too, that a larger infusion of the religious element was wanted in its work, and that the cures effected were not complete unless it could minister to a broken spirit or a mind diseased.[7]

Thus, did J. S. Newberry explain the origin of the hospital visitor. It was an individualized service meeting special needs of patients in hospitals. Note that he speaks of cures. This would appear to imply treatment. In fact, with a little imagination we see developing the triad - study, diagnosis, and treatment.

Hospital visitors are first mentioned by the USSC in Report No. 64 (1863).[12] Here the hospital visitor is recognized as one of the regular agents of the commission along with hospital inspectors and Special Relief agents. They are defined as ". . . earnest Christian men who view the hospitals in the light of humanity and religion, and carry relief and consolation to all individual cases of want, neglect or sorrow. . ."

What is very near to a principle of modern military medical social work appears in USSC Report No. 69:

> Its work is, in the highest degree, humane and charitable, for it visits and relieves the sick, destitute and miserable. But its ultimate end is neither humanity nor charity. It is to economize for the National Service the life and strength of the National soldier.[13]

These hospital visitors, like our present-day medical social workers, worked in direct and responsible relation to medicine:

> It (hospital visitor program) does not set itself up as independent of the medical officers. . .the wisdom of this plan is evident at a glance. The surgeon knows what is needed, and how to use it. An indiscriminate administering of relief by independent help is subversive of all order.[14]

The report cited above goes on to give a number of instances in which indiscreet actions of overzealous friendly visitors militated against recovery of the patient.

Mr. Newberry in his book offers this advice to hospital visitors on developing a relationship:

> He (hospital visitor) should know how to approach men with judgment and discretion, so as not to repel, but to draw them; not to shut up their hearts, but to open them, not to kill, but in every sense, to cure.[7]

This is more than a mere, blind, groping toward what modern casework refers to as "building a relationship."

There are recurrent references to the need for trained, disciplined personnel to provide these services. It was not seen as a momentary orgy of self-sacrifice, although in many instances the services of these persons could be so described. They often worked without pay. They exposed themselves to the ravages of disease. The stench from the hospitals is described as just short of unbearable. The hours were long and the elements often severe. Many died as a result of overwork. Nevertheless, the commission insisted, and the wisdom of the stand was not questioned, "He or she must come as distinctly under an obligation of duty in this respect as if under pay, and must submit to the same discipline."[4]

Dr. J. W. Bellows, President of the USSC, had this to say of the hospital visitors:

> Only a few who had a genius for the work continued in it, and succeeded in elbowing room for themselves through the never ending obstacles, jealousies, and chagrins that beset the service. Every woman who keeps her place in a general hospital or corps hospital has to prove her title to be trusted, her tact, discretion, endurance and strength of nerve and fibre. . .they carried into their work their womanly tenderness, their copious sympathies, their great hearted devotion, and had to face and contend with the cold routine, the semi-savage professional indifference, which makes ordinary medical supervision, in time of actual war, impersonal, official, unsympathetic and abrupt. Their position was always critical, equivocal, suspected and to be justified only by their undeniable and conspicuous merits. . .justified by the love and reverence they exacted from the soldiers themselves.[15]

Among those who survived, or measured up, was Miss Helen Gilson. She is described as delicate, beautiful, and possessed of an inimitable manner. Her doctrine: "The less a creature has had in the past, the more he ought to have now." Another was Miss Mary Safford, who was among the first hospital visitors.

She also introduced occupational therapy into military hospitals during the Civil War.

Mary A. Livermore is one of the strongest charitable figures of the day. While mostly known for her success in fund-raising through "Sanitary Fairs," she nevertheless took a whirl at hospital visiting. Speaking of sick, but ambulatory patients, coming to her office for material assistance, she said:

> They tarry to talk over their trials, sufferings and privations and their anxiety to get well and join their regiment. . . .They are praised heartily, petted in motherly fashion as if they were children, which most sick men become, urged to come again, and sent back altogether lighter hearted than when they came.[15]

She passes on to us also one of the few recorded vignettes of "casework" to come out of the war:

> Doctor to Hospital Visitor (Mary A. Livermore): All you can do is to help him to die easy.
>
> Patient: What does the doctor say? Oh, I know I must die, I can't! I can't! *I can't!*
>
> Hospital Visitor: Why are you afraid to die? Tell me, my poor boy.
>
> Patient: I ain't fit to die. I have lived an awful life, and I am afraid to die. I shall go to hell.
>
> Hospital Visitor (*putting hands on his shoulders and speaking in commanding tones, as to an excited child):* Stop screaming. Be quiet. This excitement is shortening your life. If you *must* die, die like a man, and not like a coward. Be still, and listen to me.
>
> The Hospital Visitor then proceeds to combat the patient's fear of death and his sense of guilt "with assurance of God's willingness to pardon."[16]

There are numerous instances of hospital visitors helping soldiers to die. This was, however, more often a chaplain's job when the end approached.

The hospital visitor, contrary to the title, was not a fly-by-night. More often he or she was a regular staff member in the sense that he or she was there regularly. Among their many functions were: arranging for furloughs or sick leaves, straightening out pay matters, consoling relatives, providing amusement, writing letters, listening to the patients' woes, arranging for transportation, correcting false charges of desertion, and providing small incidental articles and delicacies. While hardly up to today's standards of medical social work practice, they seem to be a relatively close fit, at least with reference to functions and goals.

OTHER WORK WITH THE SICK AND WOUNDED

Refreshment Saloons

One of the facilities that grew up in response to a need during the first flush of mobilization excitement and remained to become an institution for the duration of the war was the Refreshment Saloon. Originally set up as temporary shelters for volunteers on their way to Washington in response to Lincoln's first call, they were intended as overnight quarters, a place to clean up and get a bite of food; but like other facilities and efforts, they quickly adapted to changing needs and more extensive demands. The refreshment saloons were also an ideal outlet for the charitable urges of the people.

One of the most famous of these saloons was the Cooper Shop Volunteer Refreshment Saloon in Philadelphia. Commandeered as an emergency measure, it became a permanent oasis for transient soldiers and relatives. It expanded to include hospital facilities. It is this feature of its work, as well as its work with relatives seeking a son or husband who had become a casualty, that makes these saloons important to our story. For here, too, there is an evident pattern of meeting human needs which takes on a character highly suggestive of modern-day social casework services.

One should not let the language of the following extract obscure the manner in which these services were provided. Such comments should be more appropriately interpreted as the spirit in which the services were given.

> To the returned soldier it is their first home—a home like they knew in youth, their little world in which comforts abound and smiling faces shine. . .it may be called an oasis on life's pathway—a green spot in an icy world.[17]

When a soldier's "emaciated form and sunburned face" appeared at the Cooper Shop, he was given a hearty welcome, taken to a lavatory and "thorough cleansed," and presented with a change of clothing. Then:

> The feelings of the individual were entered into, and while partaking of a cup of coffee they were drawn out, whether he came from the granite hills of New England, the fair fields of the fertile Ohio, or grass clad plains and smiling sacred valleys of our own Pennsylvania. Warming under this genial influence...he would tell of the loved ones he left at home or the hairbreadth escapes he met by "flood and field" or in the "imminent deadly breach." Then would the tears flow down the cheeks of the hardy soldier... His pay he would send to his wife at home, and the children, the objects of his care and love. Was a letter to be written? Then the Lady Principal had this attended to...(speaking of one of these lady principals—Miss Anne M. Ross) She entered into the little

confidences that are so potent in their tendency to do good, and nothing in which the well being of the patients were concerned escaped her quick eye.[17]

What kind of a person was she - the refreshment saloon "case-worker?"

She had a frank, free, open and sincere manner, that spoke to the understanding and heart; a power of persuasion very rare, an eloquence that is less easy to describe than conceive; consisting in the well directed application of the thoughts that spring up in a ready mind.[17]

If the language of today could be substituted for the language of that day, there is much in the above which is directly applicable to present-day casework—sensitivity to need, starting where the patient is, nonjudgmental attitudes, individualization, respect for the human spirit.

U. S. Christian Commission

Many members of the Union clergy were heavily involved with the USSC; however, the group was also organized into the United States Christian Commission (USCC) "to minister to the spiritual wants of sick and wounded."

Their early efforts included evacuation of the wounded from the battlefield, providing food, administering to the dying, and spreading the Message of the Gospel.

This last was probably the first motivation or stimulus as reflected in such statements as these:

The soldier has a soul as well as a body, a soul to be blighted and polluted by the vices of the camp, or to be kept pure and holy for that change of worlds which to so many must come with fearful suddenness... They would invoke healing mercies for both soul and body from the Great Physician, and point them, in the struggle with the last enemy, to Him who is Abolisher of Death, and Conqueror of the Grace.[3]

To judge by the eyewitness accounts of deaths occurring in hospitals, these chaplains were wondrously effective. By their gentle ministrations, firm admonishments to ask God for forgiveness, supplicatory prayers, and soothing hymns sung "in full rich baritone filling the entire ward," the dying soldier was transformed as if by a miracle from a frightened, desperate, tormented soul to one who faces death with calm peace and a "look of inexplicable radiance and beauty" as he passes into the Last Land. The reader must make his own evaluation of these accounts, but one thing is unmistakable—the accounts of such beneficent effects are overwhelmingly abundant. These accounts are not limited to those of the clergy but include those of soldiers, nurses, hospital visitors, and military leaders.

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As the struggle wore on, the clergy turned increasingly to a concern for "temporal wants" without, of course, neglecting the spiritual. Grace Marcus was anticipated by more than a half a century:

> Understanding fully that there is sometimes more Gospel in a loaf of bread than in a sermon, it bestows the loaf of bread where it is needed and the Gospel also.[3]

They stood firm on the need for both the spiritual and temporal aspects of giving. The two could not be effectively separated.

> These money gifts are all good and indispensible to the accomplishment of the great purposes desired; but, by the side of the spirit of self sacrifice, the gift of personal service, the devotion of an earnest and generous nature to the work, how poor and worthless do they seem.[3]

Tradition dies hard, but a marked shift in emphasis is indicated in Mr. Fredrick Knapp's (himself an eminent clergyman) Third Report of the Special Relief Department, 21 March 1862, when he said:

> A miserably poor thing are priestly robes and Sunday services unless joined to a spirit and a hand which take hold of the actual work of helping men who need assistance.[8]

It is of interest to note how quickly these volunteer groups adapted to the needs without sacrificing their original purposes.

The Army's Program

As indicated earlier, the Army was unprepared at the beginning of the war for the sudden mushrooming of medical needs. But as the war progressed they developed facilities, programs, and personnel to take over areas of responsibility which had been met earlier by the USSC. Yet, it is interesting to notice that in the U. S. Army Medical Department's official *Manual for Hospital Stewards*[10] (very comparable to our present-day lay hospital administrator), which carefully outlined the duties of hospital personnel as well as hospital functions, there is no mention of hospital visitors or of any functions which were carried on by hospital visitors. This is even more surprising when the date of its publication (1863) is taken into consideration.

Now it can hardly be asserted that responsible officers were unaware of this need, because frequent references can be found of medical officers praising the persons performing these functions and emphasizing the need for such services.

Nurses were as new to Army medicine as hospital visitors, but their duties are outlined as are those of attendants. Of course there is a difference here; they were employed at a salary (12 dollars a month and all they could eat) and as paid

employees were more closely identified with the structure. Yet, even when this is considered the question remains: "Why weren't the hospital visitors employed as paid personnel?"

The tradition thus established remained until 1 July 1951, when the Army recognized medical social work as an essential part of comprehensive medical care, and uniformed personnel took over responsibility for this function from the American Red Cross.

Individually Inspired Efforts

The U. S. Sanitary Commission, the U. S. Christian Commission, and the refreshment saloons were organized, stable, charitable programs. In addition, there were a number of less organized sporadic benevolent efforts. These were largely individually inspired exploits. Many were lone operators ranging around the battlefields, meeting the needs of wounded and dying soldiers. Some women served as soldiers and fought with regiments. A few like Mrs. Turchin, wife of Colonel Turchin, even took over leadership and fought with the regiment in battle. Still others just set out "to relieve right then and there such needs as were most pressing, making themselves useful in any way they could among the sick and the wounded."[15] General Slocum was so taken with one of these, Miss Amy Bradley, a school teacher from Kennebec County, Maine, that he ordered: "henceforth you are in charge of everybody in this brigade who is sick or in trouble."[15] Miss Bradley may well have been the first military social worker to be recognized by a responsible commander.

DISCUSSION AND CONCLUSION

A Comparison of Early Casework With Special Relief Activities

If it is to be accepted that Mary Richmond represents at least one of the first persons to define social casework, it may be of advantage to compare her thinking with the practice of agents of the Special Relief Department of the USSC. This is her well-known definition: "Social casework consists of those processes which develop personality through adjustments, consciously effected, individual by individual, between men and their social environment."[19] By this definition, as elaborated in her book, *What is Social Casework?*, she definitely had in mind personality change, personality improvement, and improved adjustment in human relations. It is doubtful that the Special Relief agents, whether hospital visitors or soldiers' home workers, had much more in mind than relief of immediate suffering or correction of a social disability. Their efforts appear to be more clearly aimed at tangible services. The special emphasis on social relations in Mary Richmond's book is not evident in the work of the Special Relief agents. They did, however, treat patients

"individual by individual" and did aim toward a better adjustment of the individual and his environment.

Mary Richmond also spoke of "social insights" strengthening medical diagnosis. It is possible to read into some of the accounts of hospital visitor activities a recognition of this, but a disciplined, conscious employment of this "insight" by the doctor must be said to be absent from the practice of that day. She also speaks of social actions (tangible service) by the medical social worker as strengthening rehabilitation of patients. These "actions" she refers to "range from the humblest services guided by affection, patience, and personal sympathy, to such radical measures as complete change of environment, the organization of resources when none existed before, and the reknitting of ties long broken."[19] There is a strong resemblance here to the work of Special Relief agents.

How is the "personality growth" that Mary Richmond spoke of achieved? "By an instinctive reverence for personality and a warm human interest in people as people."[19] The attitude of Special Relief agents could hardly be described better.

Comparison of Early Medical Social Work With the Hospital Visitor Program

Ida Cannon[20] attributed the beginning of the civilian medical social service movement to Dr. Elizabeth Blackwell, the first woman doctor in America, who, as early as 1853, saw the need of tieing hospital and home together. (She makes only a passing reference to the USSC.) She defines this movement as follows:

> What we call the Medical Social Service Movement had as its purpose to bridge the gap between hospital and community, to recognize their interdependence, and to determine the relation of cause and effect in the patient's disease and his environment. At first, this purpose was necessarily expressed in rather simple, practical action directed toward the immediate need of the individual patient.[20]

Without going into a detailed analysis, it is apparent that this statement describes well the hospital visitor program. The hospital visitor did "bridge the gap" through use of therapeutic furloughs, health and welfare reports, material assistance, and recognition of the deleterious effects that concern for one's family would have on the sick soldier. Surely it would not be argued that our present caseworker isn't more skilled, but the important point is that these early Civil War workers recognized the problem and offered thoughtful, sensitive, practical individualized assistance.

Comparison of Civil War Relief Services With Current Social Work Practice

A direct comparison of present-day standards, basic principles, elements, concepts, and goals with those which emerge from an examination of the literature of the philanthropic efforts during the Civil War should be helpful in determining whether such efforts during the Civil War period could be considered the beginning of modern military social work.

Harriett Bartlett,[21] listed principles which define the relation of medical social work to the medical setting. Each of these will be taken individually, and compared with the practice of the hospital visitor.

"*Social work should bring a unique contribution to the medical setting, additional to and not duplicating the services already available.*"[21] This was a basic operating principle of the entire USSC. The hospital visitor implemented it. There were no provisions for therapeutic furloughs, communicating with families, visiting relatives, helping sick and dying soldiers with social and emotional problems relating to illness, correcting pay matters, correcting improper charges of desertion, or for returning to civilian life. The hospital visitor provided for these needs.

"*Its objective should be in agreement with those of the medical agency and thus will focus upon social problems in illness and social problems in health.*"[21] Report No. 50 of the USSC[22] discusses this in relation to working in responsible relationship to medicine. "The principle... underlying the whole design of the commission - is to work as far as possible with the approbation of the Medical Officers, furnishing supplies under their orders, or directly to *individual* cases after carefully examining into the real character of such," said Dr. Steiner, Chief Inspector of Relief, USSC.[23]

"*Social work should be organized as an integral part of the medical agency.*"[21] This has been discussed. It was not an integral part of the Army or the hospital, but the same hospital visitors worked regularly in the same hospital; it was not sporadic.

"*Its most characteristic role will be to assist patients to benefit from and make effective use of the agency's services.*"[21] This has been amply discussed. Actually, they went beyond this and created resources for unmet needs.

"*Since the work is always carried on in association with other professions, teamwork is a basic method.*"[21] There are, as has been pointed out, references to working with physicians, but no references can be found to working with nurses, for example.

"*Effort should be directed toward assisting members of associated professions in the getting to understand and deal more*

effectively with the psychological needs of patients, namely, to enlarge their responsibilities and capacities in this direction."[21] Efforts of this nature were made particularly in the matter of granting therapeutic furloughs. One incident is cited of a hospital visitor carrying the issue up to General Grant, who, after conferring with his medical director, granted the furlough. The *U. S. Sanitary Commission Bulletin* Number 18 describes an instance of a hospital visitor pointing out to a doctor the psychological value of a furlough for a patient.

With reference to the basic elements of social work, Harriett Bartlett listed these:[21]

"*Knowledge of human behavior (individual and group) and of social institutions.*"[21] Quite naturally, the content of our knowledge is different from that of the Civil War period, even as that of tomorrow will be different from ours. Yet, throughout that period, we find references to such things as regression, dependency, malingering, et cetera. They understood the importance of family and the soldier's home community. There are references to guilt, fear, and anxiety. In the discussion of the provisions for the disabled, there are indications of their appreciation for, and their knowledge of, human behavior.

"*A democratic philosophy, an attitude of deep respect for the personality, dignity and right of self determination of the individual.*"[21] In this respect, let us consider the philosophy of the Special Relief agents with regard to the disabled, their treatment of deserters, and the general philosophy underlying the Special Relief Department.

"*Skill in human relationship and in helping people toward better social functioning through use of their own strength and society's resources.*"[21] The skill they had was apparently not a conscious skill. It appears to have been in the nature of an intuitive ability. Although it will be recalled that they emphasized the relationship, it cannot be inferred that it was used consciously as a tool in the way we consider the use of relationship today. But they unquestionably did employ the individual's own strength and society's resources in treatment, as has been shown in the references to the hospital visitors' services.

"*An orderly, scientific way of thinking about social factors and social problems.*"[21] In this it is difficult to make a comparison. Judged from a practical view, they were orderly in their recognition and solution of social problems. Starting with chaos and no precedent, they brought organization, program, and efficiency in an unbelievably short time. They were systematic and methodical. They operated in accordance with policy and procedures. It was not trial and error.

"*Awareness of one's own feelings and biases.*"[21] From the material, one is obliged to conclude that this is an area which falls short of modern professional practice. There is no dearth of personal testimonials of their reaction to the problems of the sick and wounded soldier, but one cannot conclude from this that there was a conscious awareness of how this influenced their work with individuals. They had firm conviction as to what was right, often anchored in a religious philosphy. An understanding of transference and countertransference phenomena was not apparent. They did avoid hiring, and discouraged as relief agents, persons who approached their work as "a holy mission."

"*Disciplined performance in rendering social services to individuals, groups, and communities.*"[21] The need for discipline was pointed out very early in the history of the USSC. They saw the need for expertness in key positions and the importance of compensation. They saw the flaws in "orgies of sentimental philanthropy." As pointed out in this article, they insisted on all persons submitting to discipline, whether paid or not. "A sound judgment, unaffected by mere sentimentalism or unsuspecting tenderness of heart, and most certainly free from all desire of parade and show—a sound judgment, I say, conjoined with an earnest sympathy with real suffering."[23]

Harriett Bartlett stated:

> There are two great channels for helping as social workers in the medical setting: (1) offering direct services to individuals and (2) helping the agency to meet the social needs of the people more responsibly and adequately.[21]

Nothing could better summarize the efforts of the Special Relief Department of the USSC.

Now let us turn to *A Statement of Standards To Be Met by Medical Social Service Departments in Hospitals and Clinics*, prepared by the American Association of Medical Social Workers,[24] and analyze this statement on the nature of social casework:

"*Social casework in a hospital or clinic is concerned with helping the patient with personal or environmental difficulties which predispose toward illness or interfere with obtaining maximum benefits from medical care.*"[24] In a crude way, one is inclined to say that this describes the work of the hospital visitors, but it wasn't consciously focused or as discretely considered as this statement suggests. They met needs of persons in hospitals; the subtleties likely escaped them.

"*This service depends upon individualized study of the patient so that his medical situation and its interrelationship with his personal needs and problems may be understood.*"[24] This was

done, but hardly with the calculated scientific consistency aimed at in today's practice.

"*Sharing of information between the doctor and the social worker is basic to their individual understanding of the patient.*"[24] This has been established as being hospital visitor practice.

"*With this understanding, the caseworker helps the patient participate in a plan consistent with the medical recommendation and acceptable to him.*"[24] Evidence of this is an instance of a hospital visitor helping a patient accept the doctor's recommendation that he not go home, but rather that he remain and have his mother come to the hospital.

"*The study of the patient and the help that is given him proceed concurrently. Interviews with the patient and members of his family, and conferences in his behalf with professional persons are the principal methods used. The patient and his family are able to discuss their difficulties with the caseworker as they develop confidence in her and recognize her ability to help.*"[24] This scarcely needs elaboration here. The hospital visitor did talk with patients, did plan with patient and relative. They offered a "...personal service...a daily and hourly intercourse, which entered into his life and supplied his particular need."[25]

"*Casework services may range from giving concrete suggestions for dealing with a simple problem to helping with such problems as fears of permanently disabling illness, distress over disfiguring handicaps, anxieties stemming from previous experiences which may be retarding recovery, and plans for an uncertain future.*"[24] The range of simple services has been described. A case of a disfigured, married soldier who was faced with death illustrates more intensive work. The soldier wanted to see his wife and child (born since his leaving), but could not permit himself to be seen in his disfigured state. With the help of the hospital visitor, he was able to write to his wife. Following the reply, he could accept her coming. Although very shaken at the prospect, he found strength to see her. She remained with him until his death.

"*The resources of the patient and his immediate environment are primarily used in giving help, and frequently these are supplemented by the use of community facilities.*"[24] This needs no further elaboration.

"*The quality of casework services is measured neither by its duration nor its complexity, but by the evidence of recognition of human beings as individuals, each reacting to a given situation according to his own needs and with a right to determine for himself the solution to the problems it may present for him.*"[24] Individualization there was, and there is no evidence in the prac-

tice of the hospital visitor of denying the patient his right to determine his own destiny.

SUMMARY

While the Special Relief Department program resembles present-day social services provided for soldiers, both as to philosophy and objectives, the professional equipment of the Special Relief agents cannot be compared with modern social casework skills. The absence of insight into human behavior provided by modern scientific understanding and skill in the use of relationship is evident in the methodology employed by Special Relief agents; however, in their regard for human dignity, concern for individual needs, and their general democratic attitude, there is evidence of similarity to current social work philosophy. The evidence would seem to indicate that modern military medical social work in the United States Army had its beginnings in the hospital visitor program sponsored by the Special Relief Department of the United States Sanitary Commission during the period 1861 to 1865.

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MEDICINE IN THE REVOLUTIONARY WAR

"It has been believed by some that American medicine benefitted materially through its Revolutionary War experience. I find it difficult to justify such a conclusion. Brook Hindle, a recent, thorough investigator of the revolutionary period has clearly shown that scientific enterprises generally suffered during the years of the conflict. He agrees that although the stature and status of the profession were in some respects enhanced by reason of its wartime activities, scientific medicine was not notably advanced during these years. Physicians were brought together from various communities on a scale not previously experienced. Furthermore, they treated traumatic injuries in large numbers and had abundant opportunity to make some progress in epidemiology and hygiene. Although some sound principles were enunciated, the record of the profession is not distinguished by originality or far-sighted progress."

—WILLIAM F. NORWOOD, Ph. D.
in *International Record of Medicine*
p. 400, July 1958

THE IMMEDIATE IN TERMS OF THE ULTIMATE

"A mature person thinks of the immediate in terms of the ultimate. This is the basis of good living principles and sound surgical judgment. The present, or the immediate, has too often proved itself a jailer of our minds. It holds us captive. We live under the tyranny of a present incident and for this reason may react at times in very immature ways. A surgeon should have the bearing of maturity, and one way of achieving this maturity is to think of the immediate situation in terms of the ultimate goal."

—LEONARD D. HEATON, M. D.
in *Surgery, Gynecology & Obstetrics*
p. 484, April 1958

Clinicopathologic Conference

U. S. Air Force Hospital, Parks Air Force Base, Calif.*

DYSPNEA IN INFANCY

Summary of Clinical History. This female infant was born on 22 December 1955, the third child of a 22-year-old para 3, gravida 3, Negro woman. The pregnancy had been uncomplicated and the delivery was spontaneous. At birth the infant weighed 7 lb 12 oz and measured 21 inches in length. She appeared normal in all respects and was taken home on the fourth day after birth.

FIRST ADMISSION

The infant was admitted to this hospital on 10 February 1956. She had been in apparent good health until two days prior to admission when the mother had noticed that she had a high-pitched and hoarse cry. On the day prior to admission the mother noted the onset of rapid respirations. The patient was brought to the outpatient clinic where a nasopharyngitis was diagnosed and the patient was given penicillin and streptomycin sulfate. The rapid respirations continued, however, and the fluid intake was markedly decreased so that the child was admitted.

Physical Examination. On admission the infant was lethargic and only fairly hydrated. Respirations were shallow and rapid, 60 to 70 per minute. No rales were heard, but there was a slightly prolonged expiration over the left anterior chest. There was no cyanosis. There was moderate substernal and intercostal retraction. The heart rate was 200 per minute with a gallop rhythm. There were no murmurs. The liver was enlarged down to the level of the umbilicus. There was no pulsation of the liver.

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*Col. John W. Linfesty, USAF (MC), Commander. From the Laboratory Service, Maj. Robert E. Pierce, USAF (MC), Chief.

Laboratory Examination. The white blood cell count was 10,800 per μl with 1 band form, 49 segmented neutrophils, and 50 lymphocytes. Hemoglobin was 9.8 grams per 100 ml. There was moderate to severe hypochromia, anisocytosis, and poikilocytosis. The urine was yellow and cloudy with an acid reaction. A slight trace of albumin was present and there were 10 to 12 white blood cells per high-power field.

A roentgenogram of the chest on admission revealed a considerable enlargement of the cardiac shadow, predominantly to the left. The vertical measurement of the heart was suggestive of true hypertrophy. Pulmonary vascular shadows were increased, bordering on congestion.

The electrocardiogram on admission revealed an abnormal tracing with inverted T-waves over the entire left precordium (leads AVL, V_3, V_4, V_5, and V_6). This was interpreted as compatible with a myocarditis or ischemia of the left ventricle.

Course in Hospital. Upon admission the infant was placed on digitoxin by intramuscular injection, the total digitalizing dose being 0.025 mg per pound of body weight, one tenth of this being for daily maintenance dosage. A salt-free diet consisting of Lonalac (brand of powdered food similar to whole powdered milk but almost free of sodium) was given. Thiomerin (brand of mercaptomerin sodium), 0.25 ml, was injected intramuscularly, and 297 mg (300,000 units) of procaine penicillin G and 0.25 grams of streptomycin sulfate were given daily.

During the hospitalization the infant's temperature varied from 97.6 to 100.4°F. Twelve hours after the initial digitoxin was given, the infant's liver had markedly decreased in size, and the gallop rhythm had disappeared. The heart rate slowed and after three days of therapy the infant appeared normal in all respects. Repeated electrocardiograms revealed a rapid return to normal of the previous abnormalities thought to be due to myocarditis and electrocardiogram on 16 February was essentially normal.

On the 11th hospital day intramuscular administration of digitoxin was discontinued and the infant was started on oral elixir digoxin, with a maintenance dosage of 2 ml per day. The child was discharged on the 13th hospital day to be followed in the outpatient clinic.

On admission on 10 February the infant's weight was 9 lb 3 oz; the discharge weight was 9 lb ½ oz.

The child was seen in the outpatient clinic on 31 March because of a cough which had been present for two days. At this time she weighed 10 lb. There had been occasional regurgitation of food. The roentgenogram at that time showed an enlarged heart, with an otherwise normal appearing chest. Procaine peni-

cillin G, 297 mg (300,000 units), and 0.25 grams of streptomycin sulfate were given daily for three days. At the end of therapy the infant was much improved. The digoxin was continued.

The infant was again seen on 20 April in the outpatient clinic. She weighed 11 lb 9 oz, had been doing well, and there were no changes in the physical findings. At this time the first diphtheria-pertussis-typhoid vaccine injection was given.

SECOND ADMISSION

The infant was readmitted to this hospital on 4 May. For two days prior to this admission she had become progressively dyspneic, developed fever and vomiting, and the mother thought that the child had lost weight.

Physical Examination. The infant weighed 11 lb. Her temperature was 102°F. She appeared moderately dehydrated. There was prominent subcostal retraction with moderate dyspnea and respirations were 60 per minute. The cardiac dullness extended to the left axillary space. No murmurs were heard. The cardiac rate was 180 per minute. There were expiratory wheezes over the entire chest. The liver was down two fingersbreadth below the right costal margin. A large umbilical hernia was observed.

Course in Hospital. Therapy on admission consisted of Lytren (brand of complete electrolyte preparation for oral use) feedings every 3 hours; oxygen with Alevaire (brand of sterile aqueous solution containing the detergent superinone with sodium bicarbonate and glycerin); digoxin; aminophylline suppositories, 1/6 grain for wheezing; Terramycin (brand of oxytetracycline hydrochloride), 50 mg intramuscularly every 12 hours; and dextrose in water subcutaneously.

The infant appeared improved and there was a decrease in respiratory difficulty. On the third hospital day it was noted that she was much improved and the lung fields appeared clear. The heart rate was 160 per minute at this time.

The same evening she was coughing, choking, and crying. She was suctioned with a bulb syringe and much mucus was obtained. Following this she became more quiet and somewhat drowsy. At 2300 hours she was again coughing and respirations were labored and rapid, 72 per minute. Temperature at this time was 102.4°F. She was given 0.05 mg of digitoxin intramuscularly at 0200 hours 7 May. One-half hour later an aminophylline suppository was given per rectum. Following this the infant became quieter and the respirations were less labored. She awoke at 0430 hours and was crying weakly and coughing. Temperature at 0610 was 101.2°F. She died quietly at 0612 hours.

DISCUSSION

Doctor Barkin:* The CPC today is on the discussion and differential diagnosis of congenital heart defects. This is becoming an increasingly important topic because of the spectacular advances in correction of heart defects, and the fact that 2 out of 100 people are affected.

The patient was a female infant, the third child of a 22-year-old para 3, gravida 3, Negro woman. The pregnancy had been uncomplicated and the delivery spontaneous. The infant's weight, length, and appearance were normal for the first four neonatal days.

This brings up the question of the cause of congenital heart defects.[1] The only condition definitely known to produce a congenital heart defect is German measles during the first three months of pregnancy. This is something that can be prevented by your little girls having German measles while they are still little girls. Should the situation occur that the wife develops German measles during the first three months of pregnancy she may well realize from reading lay journals that she is carrying a child that will have a one out of five chance of having a congenital heart defect. This is not conducive to a happy pregnancy.

The other conditions that produce congenital heart defects have just been performed in experimental animals. Vitamin A- or vitamin E-deficient rats have been found to have litters with a higher percentage of congenital heart defects. An experiment was performed in which female rats were placed in a drum 18 inches in diameter and it was spun for 40 revolutions a minute for 300 revolutions, between the eighth and thirteenth gestational day. The percentage of congenital defects in these litters was 8.5 per cent, as opposed to the normal occurrence in rats of congenital heart defects of about 2 per cent. Such stress situations in humans would be hard to imagine.

ACTH and cortisone will produce a greater number of congenital heart defects in mice. This has not been duplicated in any other experimental animals.

The question of whether or not hypoxia can produce congenital heart defects was studied. A hypothetical case of a possible knot in the cord during the development period in the embryo can be suggested as the cause of a congenital heart defect but there has been no evidence of it. There are different teratogenic agents like trypan blue and triethylenemelanine known to produce congenital heart defects. At the present time, except for the question of irradiation, where experimental animals also have a greater number of congenital heart defects, German measles is the only condition known to definitely produce congenital heart defects in the human.

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*Capt. Gilbert D. Barkin, USAF (MC), Chief, Pediatrics Section.

The patient was admitted to the hospital at the age of 7 weeks. She was brought into the hospital because of nasopharyngitis, a rapid respiratory rate, and she was in heart failure with a heart rate of 200 per minute. The liver was enlarged to the level of the umbilicus.

The laboratory data revealed an increased number of neutrophils over the normal number for a 7-week-old child and the hemoglobin was a little low with a moderately severe hypochromia so that there was a possibility that this child had an iron deficiency anemia due to the fact that the mother was deficient in iron during the pregnancy. A slight trace of albumin was present in the urine. This frequently occurs in a patient with congestive heart failure.

X-rays of the chest revealed a considerable enlargement of the heart shadow predominantly to the left. This signifies a left- and/or right-sided enlargement of the heart. It was interpreted as suggestive of true hypertrophy, and this is unusual, as few radiologists will make such a statement from looking at an x-ray. Pulmonary vascular shadows were increased, bordering on congestion. This is a very important point to observe in placing congenital heart lesions into various categories. The fact that the child was in failure doesn't give this x-ray too much meaning. If the child were not in failure one would look closely at the pulmonary vasculature to see if it were increased, normal, or decreased. This doesn't always place us in the correct category, and the reason for that is the knowledge of what happens to the pulmonary vasculature under stresses of congenital heart lesions. At birth the size of the lumen of the pulmonary arteriole is normally one-half that of the diameter of the musculature. When the child takes his first breath and the alveoli begin to open, the lumen of the pulmonary arteriole also increases in size and the ratio becomes greater than that of the musculature. In one month the lumen of the arteriole becomes three times the size of the musculature, and in the adult the lumen is five to six times the size of the musculature.

There are three things in congenital heart defects that affect the pulmonary vasculature. One of these is the ejective force of the stream upon the pulmonary bed. The ejective force is defined as the flow of blood that is produced through a ventricular septal defect that is greater than 40 per cent the diameter of the aortic orifice. This defect, of course, produces the greatest stress on the pulmonary bed. The second factor that affects the pulmonary vasculature is increased blood flow. This is present in many congenital lesions in varying degrees: the atrial septal defect, anomalous pulmonary drainage, patent ductus, and several others. The third factor is the back pressure produced by obstructive lesions distal to the pulmonary flow, such as mitral stenosis.

Normally the pressure of the blood going through the pulmonary system is only 20 to 25 per cent that of the systemic blood flow. In cases such as an interventricular septal defect, where the blood is pushed through under greater pressure, the lumen increases in size,

the left side of the heart has to work harder to draw off this extra amount of blood in the pulmonary system and the pressure in the pulmonary system may go up to equal the pressure in the systemic system. This would, of course, produce the greatest stress on the pulmonary vasculature. In this event either the nervous system responds by contracting the lumen of the pulmonary vasculature, thereby decreasing the pressure of the pulmonary system relative to the systemic system, or the muscle of the arteriole hypertrophies and there is intimal proliferation to produce greater resistance in the pulmonary vasculature. The other chance in a large ventricular septal defect is that the heart would increase in size while the ventricular lesion would remain about the same size becoming smaller than 40 per cent of the size of the diameter of the aortic orifice. There the ejective force factor would be no longer present, and there would be less stress on the vessels of the pulmonary bed.

The vasculature is described in three phases: (1) the normal evolutionary pattern with the increasing size which I have described, (2) the muscle hypertrophy and intimal proliferation, and (3) an irreversible change in the pulmonary bed. This has the greatest effect on the prognosis of the patient. Some conditions produce these changes more rapidly than others. With an interventricular septal defect there may be irreversible changes in the first year. In an atrial septal defect there may be no changes in 20 years of life. With anomalous pulmonary drainage, changes may occur in the first few years of life. So it depends upon the type of congenital heart defect how seriously one must consider these pulmonary vascular changes and how rapidly an operative procedure must be performed. Of course, every condition varies with t he relative size and relative increase in blood flow.

The electrocardiogram is interpreted as compatible with myocarditis or left ventricular ischemia. This gives us the category into which this patient most probably fits. She is an acyanotic child, who has no murmur, and one in whom left ventricular involvement probably is primary.

There are five congenital heart defects plus acute myocarditis, which frequently confuses us in diagnosing such a congenital heart defect. The most common condition in this category is primary endocardial fibroelastosis. This is a condition that constitutes 7 per cent of all major heart malformations. Here, there is a fibroelastic thickening of the endocardium with pressure upon the Thebesian vessels with decreased flow of blood to the muscle, producing left ventricular ischemia.

The other conditions are: 1. Glycogen storage disease. This is a difficult one to rule out. It is caused by the deposition of glycogen in the heart muscle and it may produce ischemia. However, it is usually generalized throughout the heart. 2. In some cases the left coronary artery arises from the pulmonary artery. Here, with the decreased oxygen content and decreased flow there may be a lack of oxygen to the

heart muscle. Frequently there is an anterior myocardial infarction pattern on the electrocardiogram and there may be dilation of the ventricle. 3. Sometime the coronary arteries are lined with calcium giving signs of cardiac insufficiency. 4. A rhabdomyoma may also produce a large heart, and this must be included in the differential diagnosis.

Myocarditis is the more common situation to be brought up in a case like this, to be differentiated from fibroelastosis. Frequently it is differentiated by the response to digitalization. As we see in the discussion, the child was placed on digitoxin and responded within a 12-hour period. This is a good point favoring one of the congenital defects over myocarditis. The digitalizing dose of digitoxin in this case was 0.025 mg per pound of body weight. A study done on digitalizing doses at St. Louis Childrens Hospital showed that 0.045 mg per kg of digitalis did not seem to produce any more desirable effects than 0.035 mg per kg.[2] This was certainly a good digitalizing dose for this patient. A salt-free diet, mercurial diuretics, and antibiotics also were used. Within three days the child appeared normal on physical examination, with electrocardiographic findings returning to normal. The change of the electrocardiogram to normal would be unusual in a myocarditis.

The patient developed a second upper respiratory infection which responded rapidly to streptomycin sulfate and penicillin. The heart was noted at this time to be enlarged with an otherwise normal appearing chest. We deduce from this that there was probably a normal pulmonary blood flow. The enlarged heart doesn't indicate to us whether there was any particular change in enlargement or whether it appeared to be left- or right-sided enlargement.

At four months of age this child weighed 11 lb, 9 oz. At four to five months a child usually has doubled his birth weight, which would make this child a little underweight. This child, of course, had repeated respiratory infections and episodes of heart failure.

The patient was readmitted at four and one-half months of age with an episode of asthma, which threw her into a second episode of congestive heart failure. Infection appeared to predispose this child to asthma. The treatment was complete and the child did respond. On the second day of hospitalization, however, because of some mucus in the throat, coughing and choking occurred, and this was enough to throw the child into cardiac failure and cause her death.

In the differential diagnosis of this condition, in the category of the acyanotic child with no murmur, are there any procedures that could have been done to further differentiate the congenital heart lesion? An anomalous pulmonary vein could produce a similar situation, except that there would be right ventricular hypertrophy. This is a differentiating point between the five conditions that I have mentioned and anomalous pulmonary drainage. To find out before the death of a patient if this condition exists, an angiocardiography occasionally helps,

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but here it would only help if the pulmonary vein drained into one of the larger veins, such as the inferior or superior vena cava, and we were lucky enough to have some dye going into the pulmonary vein. Frequently there is an atrial septal defect associated with the anomalous pulmonary vein, but in view of the repeated statement that there were no murmurs, this does not appear to have been present.

Glycogen storage disease may be shown by the presence of increased amounts of glycogen in muscle at biopsy. However, this may not be positive. The other tests that will tell us if the patient has glycogen storage disease of the liver type do not apply to the cardiac type. In the patient with storage of glycogen in the liver there appears to be an absence of glucose-6-phosphatase and the patient cannot change glucose to glycogen or glycogen to glucose; therefore, there is a low fasting blood sugar and frequently acidosis and ketonuria because of the breakdown of fats to supply energy. There may be a blood lipid level of up to 5 mg per 100 ml. When a glucose tolerance test is made in these patients, the glucose is high because it isn't converted to glycogen. These tests do not apply to the cardiac type of glycogen storage disease. In the case of the left coronary artery arising from the pulmonary artery there is no good diagnostic finding except for the presence of an anterior myocardial infarction pattern on the electrocardiogram. The other condition, rhabdomyoma, would just be found at autopsy. We would tend to rule out myocarditis because of the patient's rapid response to digitalization.

And so, favoring the more probable and common lesion, my feeling is that on autopsy of this patient we would find a primary endocardial fibroelastosis.

In fibroelastosis, as well as in cases of left coronary artery arising from the pulmonary artery, a surgical procedure that has been suggested is to put talcum on the pericardium in an attempt to increase the collateral circulation. Several patients reported on in the literature have been doing well two to three years after this surgical procedure.

Doctor Paul White[3] reported some adult cases of fibroelastosis, and in similar situations where they have tried to relieve coronary insufficiency in adults it has not been too successful.

There are two main types of fibroelastosis, one of a dilated heart, the other a contracted heart. In the dilated heart, which forms the majority of cases, the left ventricle and left atrium are the two chambers most often involved, although occasionally the right ventricle may be affected. In a fair number of cases, 10 to 20 per cent, the mitral valve will be involved, so that a child with a murmur in this region would not rule out fibroelastosis.

Doctor Brogdon:* The initial posteroanterior chest film on this child (fig. 1) shows a rather marked enlargement of the cardiopericardial

*Capt. Byron C. Brogdon, USAF (MC), Radiologist.

silhouette. This enlargement is of a diffuse, globular, nonspecific nature. There is, in addition, a considerable accentuation of pulmonary markings bilaterally. We take this to be evidence of pulmonary congestion and cardiac failure. In view of the generalized diffuse enlargement of the cardiopericardial shadow, I do not believe that we could comment accurately on specific anatomic changes.

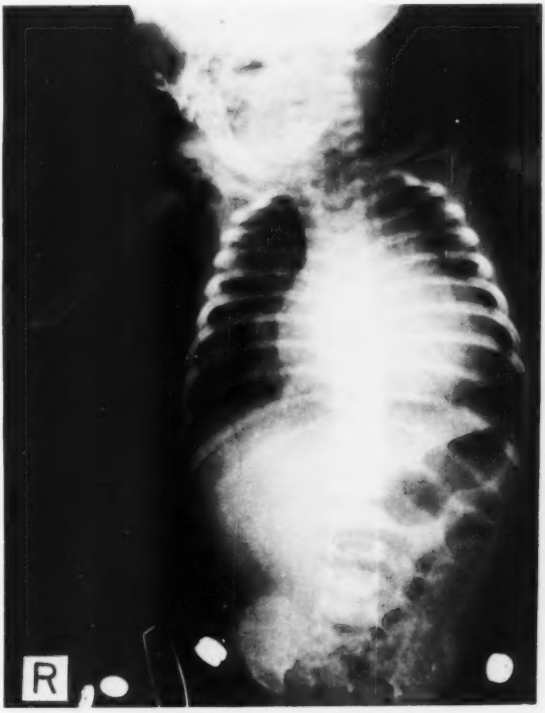

Figure 1. Initial chest film showing enlarged heart and accentuated pulmonary markings.

The next chest film was obtained during the patient's initial hospitalization and after digitalization. Again we see an enlarged globular heart with increased pulmonary vascularity. The child was fluoroscoped at this time and the fluoroscopist reported no specific changes. He did note that there was, throughout the cardiopericardial silhouette, a diminution of the amplitude of pulsations. Apparently there were no specific changes at this time to suggest a pericardial effusion to the fluoroscopist. Hence, from this point, we will assume that this is cardiac enlargement and that there is no pericardial effusion. As Doctor Barkin has pointed out, we make no attempt to differentiate between cardiac dilatation and hypertrophy. In my opinion, there is no real

difference in the appearance of these processes radiographically, and frequently both processes are present simultaneously.

The third chest film on this child is dated 5 March 1956 at which time the child was considerably improved clinically. There has been considerable improvement in the appearance of the chest as well. The heart is still quite large, but is perhaps a bit smaller than on our previous film studies. Certainly, the patient appears much better compensated at this time with the pulmonary markings approaching normal. The liver shadow is also somewhat smaller than on earlier films.

The final chest film (fig. 2) shows the enlarged heart with the left border projected all the way out against the left lateral thoracic wall.

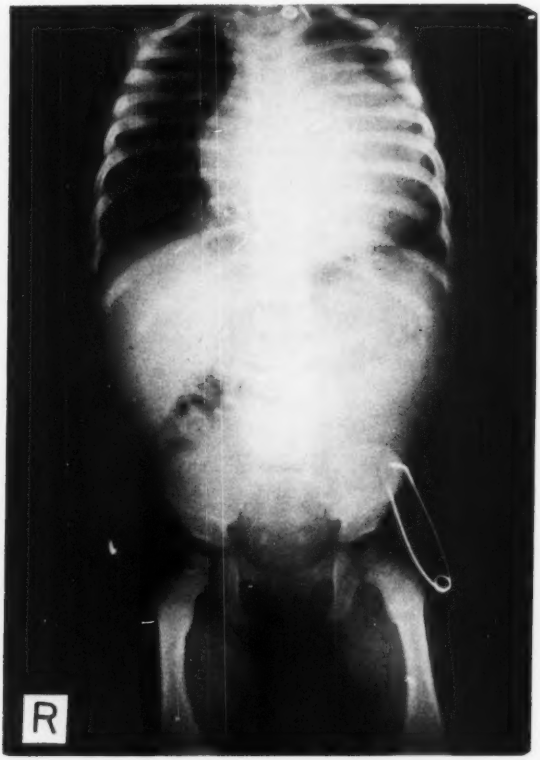

Figure 2. Final chest film showing enlarged heart and prominent vessels in right lung.

Once again the child appears to be in failure, with a rather marked prominence of the vessels in the right lung field. The left lung field is, for the most part, obscured by the cardiac silhouette.

In summary, the findings are these: (1) a very large globular heart which progressively enlarges, but in which there are minimal changes from time to time; (2) episodes of failure and of compensation; (3) an acyanotic child; (4) no significant murmur; (5) repeated bouts of upper respiratory infection; (6) a child who was apparently normal at birth and shortly thereafter.

I would agree with Doctor Barkin in that I doubt that this falls within the acyanotic or cyanosis tardive types of congenital heart disease. In such cases there ordinarily is not as massive enlargement of the cardiopericardial silhouette, and in most instances there are rather typical murmurs. In addition, in many of the acyanotic types there are specific anatomic changes which are apparent radiographically.

I believe that this most likely represents a case of endocardial fibroelastosis. Roentgenologically, one cannot differentiate this disease from glycogen storage disease of the heart. However, it is my impression that in glycogen storage disease the heart will not respond as readily to digitalis therapy and that it does not show as much change from film to film.

Doctor Barkin: Do you think that barium by mouth would have helped to show if the left auricle was enlarged?

Doctor Brogdon: Actually, this patient was given barium at the time of fluoroscopy referred to previously; this did not contribute any additional information. The left atrium was enlarged, but not inordinately so. All chambers appeared diffusely enlarged. Ordinarily, any attempt to demonstrate specific chamber changes in the massively enlarged failing heart is fraught with difficulty.

Doctor Worthman:* In the standard leads of the electrocardiogram (fig. 3) there is not the degree of right axis deviation that I would expect in a child of just a few months of age. The QRS complex in II and III are primarily upright and in lead I there is a small S. In aVR there is a small R'. If there were a right ventricular predominance one would expect a tall R and R' in lead aVR. The rather prominent QRS in aVF lead and an R equaling the S in aVL throws it pretty much into a vertical or semivertical position which is the position one would expect in this age group. In the precordial leads we have a tall initial R in V_1 with an S of about a third the size. Progressing to the left side there is not a great deal of change. On the left side there is still a rather tall R with an S of about a third the size of the R. The T waves are more inverted as we get over on the left side than they are on the right. This is somewhat opposite to the pattern seen normally wherein the T waves are inverted in leads V_1, V_2, V_3, and even V_4, tending to become upright in V_5 and V_6. There is some elevation of the S-T segment on the left side, starting about V_4, which looks significant. In essence, it looks to me as though there is evidence of strain, if you will accept

*Major Robert H. Worthman, USAF (MC), Cardiology.

the term, on the left side, as manifested by less right axis than I would expect and the S-T segmental and T-wave changes over the left precordium.

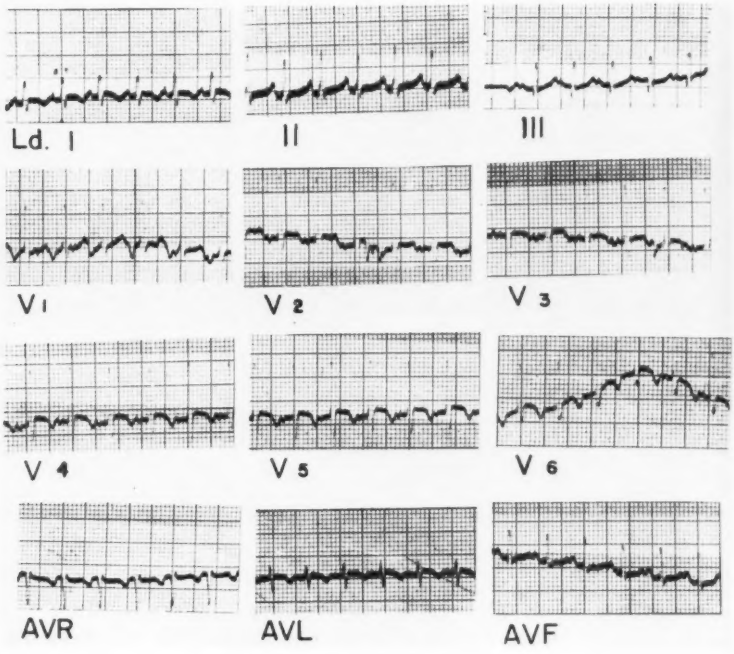

Figure 3. Initial electrocardiogram.

In the next electrocardiogram (fig. 4), following treatment, there has been some change in that the S-T elevation doesn't seem to be apparent at all. This segment is isoelectric. The T wave is upright in V_6, apparently upright in V_5 and in V_4. Another feature here is that the voltage of the QRS is smaller in V_6. In general, I think that this would go along with improvement in the status of the left ventricular musculature in a rather nonspecific way. I can't really account for the low voltage in V_6.

Dr. Barkin's diagnosis:

Congenital heart disease, probably endocardial fibroelastosis.

Dr. Brogdon's diagnosis:

Endocardial fibroelastosis.

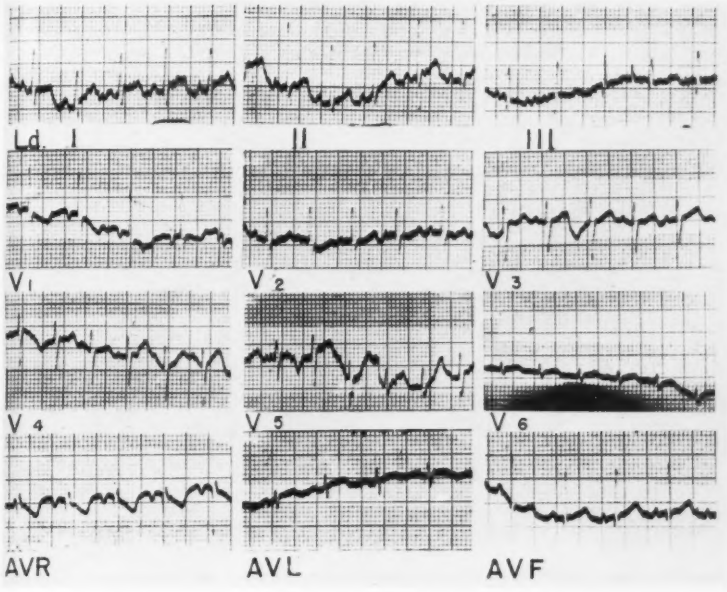

Figure 4. Electrocardiogram following digitalization.

PATHOLOGIC FINDINGS

Doctor Pierce: At autopsy the body was that of a fairly well-developed and well-nourished Negro female infant which demonstrated a moderate degree of dehydration. A small reducible umbilical hernia was present.

The lower edge of the liver was about 3 cm below the right costal margin in the midclavicular line. About 5 ml of clear amber fluid was present in each pleural space. The heart was markedly enlarged, taking up an estimated one third of the entire thorax. The left lung was compressed and there was a mild mediastinal shift to the right side.

The right lung weighed 98 grams, the left 49 grams. There was compression atelectasis of the left lung.

The heart weighed 87 grams, as compared to an expected normal of about 60 grams.[4] This enlargement was due principally to left ventricular hypertrophy. The principal gross abnormalities were in the left ventricle. The endocardium of the entire left ventricle (fig. 5) including the papillary muscles, was opaque, gray-white, and averaged 1 mm in thickness. This change did not include the valves. All chambers of the heart were slightly dilated, but to a much lesser degree than the left ventricle. The coronary arteries had a normal origin, appearance, and distribution.

The liver weighed 200 grams (the very upper limit of normal) and was normal in shape and consistency. The cut surface showed light-tan liver tissue with fairly prominent markings.

The other organs were grossly normal.

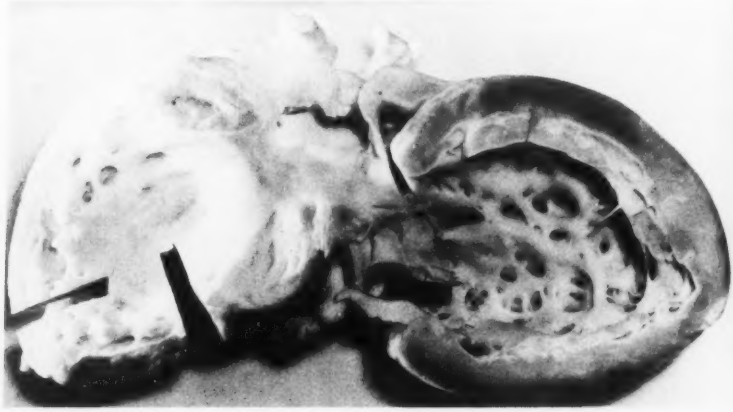

Figure 5. View of the opened left ventricle showing the thickened endocardium.

Microscopic examination of the left ventricle (fig. 6) showed a prominent, fairly uniform thickening of the endocardium due to increased connective tissue. There was prominent collagen formation associated with the increased fibrous tissue. Special stains (fig. 7) also demonstrated the increase in the elastic fibrils. In areas there were extensions of the fibrous tissue short distances into the adjacent myocardium. The myocardium showed hypertrophy.

The gross and microscopic findings are characteristic of so-called endocardial fibroelastosis. The manner of death is attributed to a rather acute cardiac failure secondary to the cardiac insufficiency produced by the endocardial fibroelastosis.

This clinical entity was first named endocardial fibrosis by Weinberg and Himelfarb[5] in 1943. It is characterized by a noninflammatory fibrosis of the mural and valvular endocardium, particularly in the left cardiac chambers. Usually both aortic and mitral valves are involved, and often the myocardium is hypertrophied. Occasionally the right side of the heart dilates and hypertrophies. Congenital defects are often found, such as aortic hypoplasia, transposition of the great vessels, patent ductus arteriosus, and patent foramen ovale.[6]

Clinically, these infants are normal at birth. The onset of signs or symptoms is sudden. Cyanosis is the commonest complaint. Irritability, anorexia, dyspnea, and cough are frequent. Physical examination shows signs of congestive heart failure. The heart may or may not be enlarged, and usually a precordial systolic murmur is heard; occasionally a

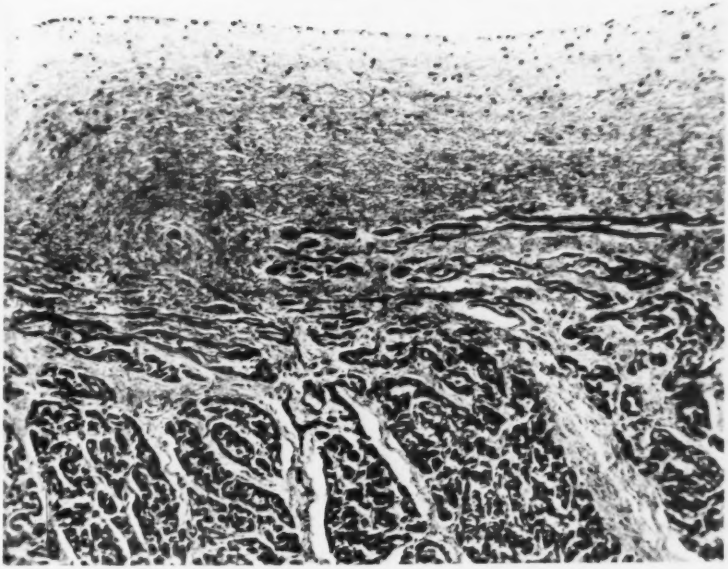

Figure 6. Photomicrograph of left ventricular endocardium showing marked fibrous thickening. (hematoxylin and eosin stain, × 100)

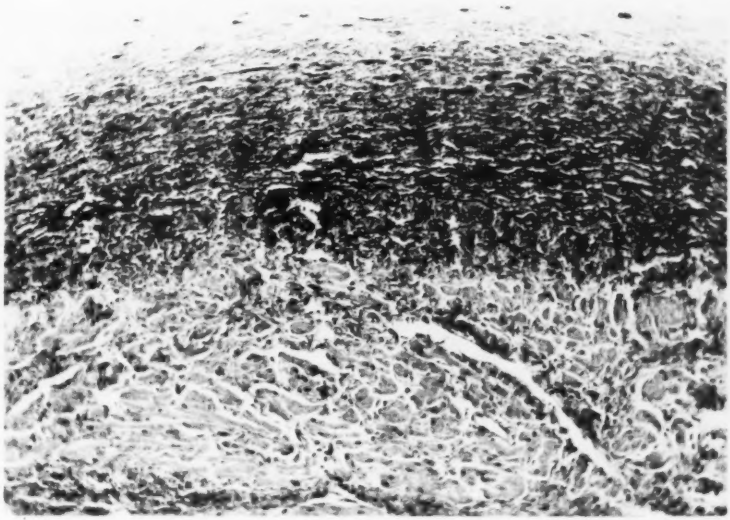

Figure 7. Photomicrograph demonstrating increased elastic fibrils. (Verhoeff's elastica stain, × 150)

diastolic one is also present. After the clinical picture develops, the duration of life is often short, usually not more than 10 days. The average age at the time of death is 4 to 6 months.[6] Left ventricular failure is the most common cause of death.

The left side of the heart, especially the left ventricle, is involved more often and more severely than the right side. The endocardial thickening may be diffuse in the left ventricle and patchy in the other chambers, or diffuse throughout the entire heart. Deformities of the mitral and aortic valve are present in about 50 per cent of cases, while involvement of the pulmonary or tricuspid valve is less frequent.[7]

The cause of the condition is unknown, but many varying factors have been proposed. The possible role of maternal toxemia and infection has been widely discussed. The evidence in favor of an intrauterine infection is not convincing. There is little histologically to support an infectious basis. The lesions are conspicuously free from inflammatory cells. Only one case of fibroelastosis associated with rubella in the fourth month of pregnancy has been reported.[8] Weinberg and Himelfarb[5] reported two siblings, the second and third pregnancies, with this entity. Those pregnancies were both uneventful.

In those cases associated with aortic valve lesions or coarctation, it has been suggested that the myocardial and endocardial thickening represent hypertrophy caused by increased work. Another suggestion is that the endocardial thickening might result from the organization of mural thrombi. However, such lesions are different from the smooth, diffuse thickening found in fibroelastosis. Also the intermediate stages in the process of organization are not observed.

Still another suggestion has been made that fibroelastosis should be classed with the "collagen diseases."[5] Nothing resembling fibrinoid has been found and there is no other similarity of this disease to the recognized members of the collagen disease group.

Most recent authors have taken the view that fibroelastosis represents a primary abnormality of fetal development, an endocardial dysplasia of unknown cause. In the present stage of knowledge it would seem impossible to go further than this.

There have been several reports of diffuse endocardial sclerosis in adults. Grossly there is some resemblance to the infantile lesion, but it is considered that the two conditions are not related.[6]

Pathologic diagnosis:

1. Endocardial fibroelastosis with myocardial failure

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SOLDIERS AND LABORATORY ANIMALS

"No military commander is entitled to subject his men to risks and sufferings which he himself would not be prepared to endure if, *mutatis mutandis,* circumstances required him to do so. . . .We may bear in mind also that circumstances do not ordinarily require a divisional commander to expose himself to the same risks as the front-line troops, however often he may have done so in his younger days; his duty is now different from theirs. But in principle he ought to be ready to face anything he calls upon them to face. If we turn now to the biologist, we may say that only in rather exceptional cases can he usefully subject himself to experimental procedures in the laboratory, though a number of research workers have done this from time to time. On the other hand, he may usefully ask himself whether, if he were this or that experimental animal, he would be willing to make voluntarily the sacrifice which he is calling on the animal to make, for the sake of the purpose for which the experiment is to be performed; apart always from any question of life and death, and account being taken only of any pain, discomfort, or stress that may be entailed."

—C. W. HUME, Maj., M. C.
in *Lancet*
p. 426, Feb. 22, 1958

CASE REPORTS

Thrombophlebitis and Vertebral Osteomyelitis in an Infant

MANARD E. PONT, *Captain, USAF (MC)*

THROMBOPHLEBITIS is a disease so uncommon in infants that it is not mentioned in the standard textbooks of pediatrics. It is seen almost exclusively as a complication of such procedures as venous catheterizations, in "cut-downs"; or secondary to venous stasis resulting from occlusion of large veins, as by a large retroperitoneal tumor.

Acute hematogenous osteomyelitis, on the other hand, is considered a rather common disease of childhood, although its incidence has decreased markedly since the introduction of antibiotic therapy on a widespread scale. This decline is said to be the probable result of the frequency of antibiotic treatment in such conditions as respiratory infections, cellulitis, and boils, which are considered to be the precursors of acute hematogenous osteomyelitis.[1] The disease, which is secondary to a bacteremia, was classically described as being caused by *Micrococcus pyogenes* var. aureus (*Staphylococcus aureus*) in the majority of cases, although *Streptococcus hemolyticus*, pneumococcus, and *Escherichia coli (Bacillus coli)* were considered to be common etiologic agents.[2] Within recent years, there have been an increasing number of case reports indicting the gram-negative organism of the salmonella group as the etiologic agent.[3-6]

The disorder involves a primary lodgment of organisms in the metaphysis, the cancellous bony portion adjacent to the epiphysis of a long bone. The organisms then spread into the medullary cavity, through the Haversian canals into the subperiosteal spaces. Bone necrosis and the formation of sequestra are the common sequelae of this process. Vertebral osteomyelitis differs from the osteomyelitic process in the long bones, however, in (1) the absence of sequestra formation, and (2) a characteristic massive new bone formation which occurs early in the process. Collapse of the vertebra is less common than might be imagined because the severity of the pain usually forces the patient to lie recumbent from an early stage of involvement.[2]

From U. S. Air Force Hospital, Tachikawa, APO 323, San Francisco, Calif.

The clinical picture of acute hematogenous osteomyelitis is highly variable, some cases demonstrating a high degree of systemic signs and toxicity, while others show almost no systemic involvement whatever. Of interest in our case is the statement of Blanche[7] that infants ordinarily tend to demonstrate few systemic signs, despite multiple foci of involvement.

CASE REPORT

This male child was born on 8 January 1957 to a 44-year-old woman, para 5, gravida 8, following an uneventful pregnancy and delivery. He weighed 6 pounds and 12 ounces. The post-partum period in the hospital was uneventful, except for a routine circumcision performed without anesthesia at the age of three days. On the day following circumcision the child was discharged from the hospital.

The child was not seen again until the night of 22 January, when he was brought to the hospital dispensary with a fever (103.2°F rectally), and the complaint that he kept his left leg flexed and refused to allow it to be extended, as if it were very painful. At this time examination of the child revealed no physical findings, except an evident tenderness of the leg and resistance to movement. The leg was not red, swollen, or discolored. He was referred to the pediatric clinic where a tentative diagnosis of Caffey's disease (infantile cortical hyperostosis), was made. This is a syndrome characterized by subperiosteal calcification, soft tissue swelling, fever, local heat and tenderness, and elevation of the serum alkaline phosphatase. When he was seen again four days later, he was apparently doing well in that he had been afebrile. However, he apparently still had a painful leg and cried loudly when it was moved. When he was seen again, on 1 February, the mother complained that the left lower leg was apparently larger than the right one and appeared to be darker. At this time, the right calf measured 5½ inches and the left calf 6¼ inches in circumference.

On 6 February, the child was admitted to the pediatric ward with a diagnosis of Caffey's disease. At that time he was moderately well developed, well nourished, and weighed 7 lb 13 oz (a gain of 1 lb 1 oz in the one month since birth). He appeared to be healthy; and examination of the eyes, ears, nose, throat, chest, heart, and upper abdominal region were negative. However, the left lower quadrant of the abdomen, the left side of the scrotum, and pubic region were markedly edematous; marked venous distention was seen over the left lower quadrant. The left thigh was markedly swollen and reddened, and there was a deeply cyanotic cast to the lower part of the left leg. Pitting edema was present to plus 2 or 3 below the knee. The patient had a temperature of 101°F, rectally. The admission blood studies revealed a white cell count of 20,350 per μl, and a hemoglobin of 11.8 grams per 100 ml. Urinalysis revealed 8 to 10 white blood cells per high-power field. The throat culture contained hemolytic *M. pyogenes* var. *aureus* (80 per cent). Repeat white blood cell and differential counts on 10 February revealed 15,000 cells per μl, with 66 per cent neutrophils,

25 per cent lymphocytes, 6 per cent monocytes, and 3 per cent eosinophils. A blood culture drawn at the time of admission revealed nonhemolytic coagulase-positive *M. pyogenes* var. *aureus* sensitive to bacitracin, chloramphenicol, streptomycin sulfate, and erythromycin. All roentgenographic findings were normal at this time.

On the basis of the clinical and laboratory findings, a diagnosis of thrombophlebitis of the left common iliac vein with septicemia of *M. pyogenes* var. *aureus* origin was made. The patient was placed on a regimen of antibiotics and anticoagulants. This consisted of 150 mg (150,000 units) of procaine penicillin G intramuscularly every six hours and 50 mg of erythromycin by mouth every six hours. Depo-Heparin Sodium was started on 7 February, 16 mg every 12 hours, with no apparent lengthening of the clotting time after 24 hours. On 8 February, heparin sodium, 10 mg every 12 hours, was given; later this was increased to 10 mg every eight hours. On 9 February the clotting time was 4½ minutes, and it rose slowly to 6 minutes by 18 February. The dosage was decreased slowly to withdrawal from 18 to 23 February. Within two days after the beginning of this combined therapy, there was marked subsidence in the edema, apparent pain and immobility of the leg. On 16 February, despite the subsidence of the pain and sweiling, and a decline in fever to normal, the white blood cell count remained elevated at 21,700 per μl, with 44 per cent neutrophils, 55 per cent lymphocytes, and 1 per cent eosinophils.

On 16 February, a roentgenogram of the abdomen was suggestive of a mass in the retroperitoneal abdominal area which had been suspected as the cause of stasis in the venous system, leading to thrombosis. A pyelogram on 18 February, however, did not reveal an abnormal mass within the retroperitoneal space (fig. 1).

Collapse of the body of the fourth lumbar vertebra was first noted on 26 February, on a routine roentgenogram (fig. 2). This suggested (1) metastatic malignancy, (2) tuberculosis, or (3) acute hematogenous osteomyelitis. On 2 March, a roentgenogram of the chest revealed consolidation of the right upper lung field, with scattered radiolucencies suggestive of abscess formation; among the possible causes, staphylococcal pneumonia was prominently considered. The roentgenogram of 6 March demonstrated collapse of the bodies of the fourth and fifth thoracic vertebrae (fig. 3), and there was the suggestion of a large mass to the left of the thoracic spine. At this time, all blood cultures (except the initial one), urine cultures, and spinal fluid cultures had been negative. On 6 March, streptomycin sulfate, para-aminosalicylic acid (which was discontinued on 18 March) and isoniazid were started, despite negative tuberculin skin tests and no bacteriologic evidence of acid-fast bacilli.

On 12 March, a conference of the pediatricians, radiologist, surgeons and orthopedic surgeons determined that an exploratory laparotomy was indicated, to investigate possibility of retroperitoneal mass and possible primary tumor. A retrograde pyelogram revealed essentially normal renal patterns bilaterally, but the upper ureter was somewhat

beaded and the middle third was displaced laterally on the anteroposterior and oblique views at the level of the collapsed vertebra. It was believed that the genitourinary tract in itself was normal,

Figure 1. The pyelogram of 18 February 1957, showing a normal fourth lumbar vertebra.

but that there was displacement of the ureter by a probable retroperitoneal mass. It was thought that this space should be explored to establish a diagnosis for definite therapy. Because of the child's

condition, this operation was delayed until 3 April, by which time marked clearing of the lungs had occurred, and there was general improvement in his condition.

Figure 2. On 26 February 1957, collapse of the body of the fourth lumbar vertebra is well demonstrated.

On 3 April, following intravenous pyelography, which neither substantiated nor ruled out a retroperitoneal mass, the child underwent laparotomy. Through a low flank incision, the peritoneum was reflected

anteriorly and the retroperitoneal space explored. The left ureter was adherent to the sigmoid colon. There were no masses along the vertebral column. The kidneys were found to be normal. The peritoneal cavity was explored through a small incision in the peritoneum and no abnormalities were found. The vertebral space was aspirated and 5 ml of bloody fluid was obtained. The fluid was found to be negative for bacteria, acid-fast bacilli, and fungi. Postoperatively, the patient did very well, and symptoms of acute infection subsided.

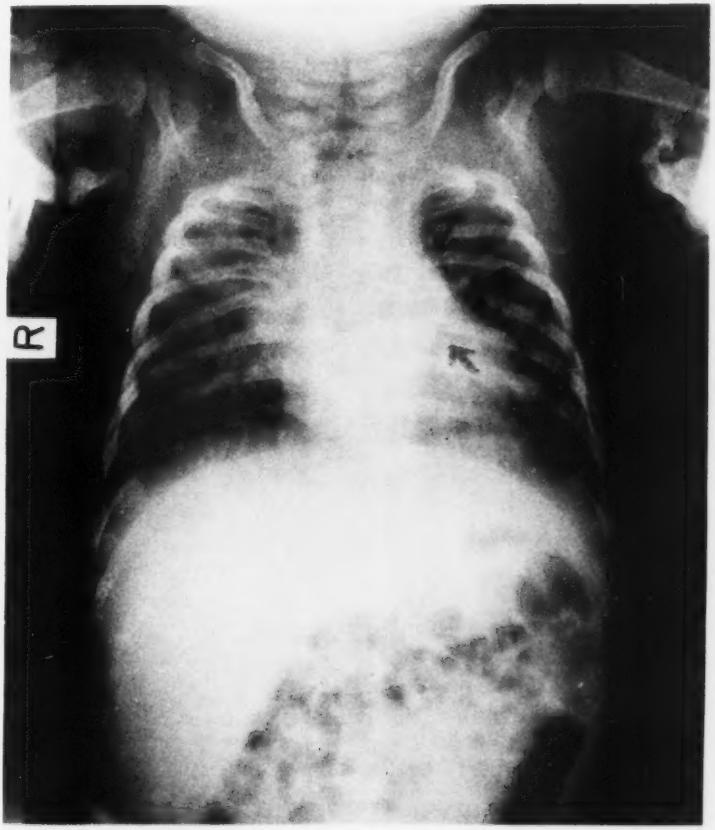

Figure 3. By 6 March 1957 the fourth and fifth thoracic vertebrae had collapsed, and a bulge to the left could be seen. Some of the infiltrate in the right lung was still present.

On 13 April, the child was discharged from the hospital. At this time, he had developed to within normal limits and showed no signs of disease except for the three collapsed vertebrae. Early in May, he was placed in a cast by the orthopedic surgeons for immobilization of the collapsed vertebrae. Erythromycin was substituted for chlo-

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ramphenicol early in May 1957. The patient continued to be followed at monthly intervals. The erythromycin was discontinued at the end of August. The cast was removed in October. During this time, remark-

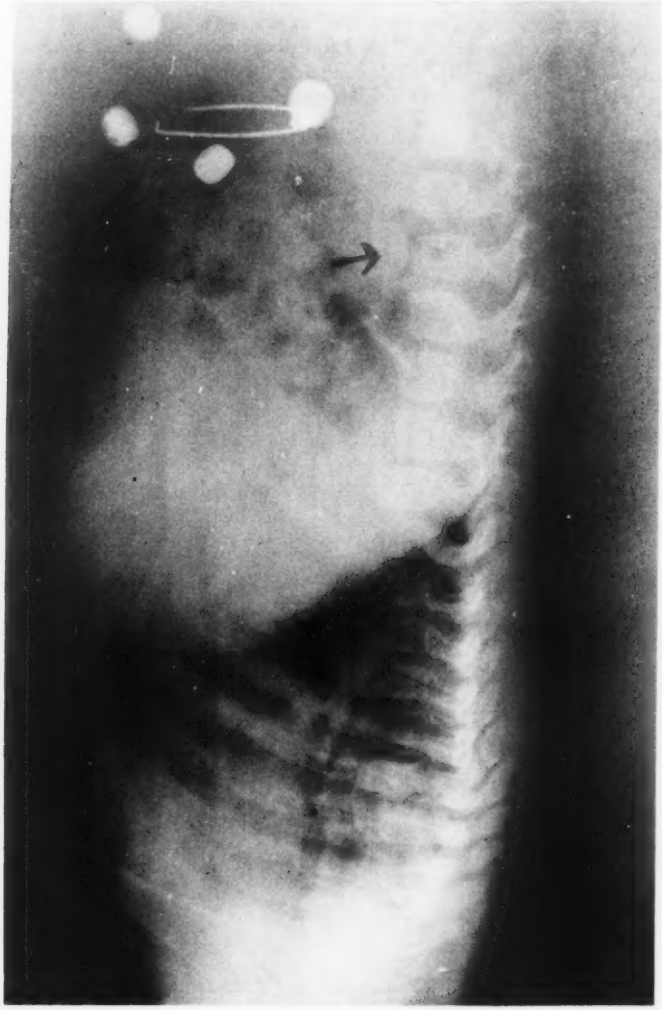

Figure 4. Roentgenogram made on 17 December 1957, showing good reconstruction of the fourth lumbar vertebra. Callus also is present at the fourth and fifth thoracic vertebrae.

able healing of the collapsed vertebrae was seen. The patient continued to develop and to gain weight, and showed no evidence whatever of active disease. A roentgenogram on 17 December showed good

construction of the fourth lumbar vertebra, and callus was present at the fourth and fifth vertebrae. (fig. 4).

DISCUSSION

Within recent years staphylococcal infections have assumed an increasing importance among the diseases of early infancy. It is likely that the dramatic and tragic nursery epidemics of staphylococcal infections have been a major factor in directing attention to this group of diseases. However, in addition, during an era when most infectious diseases, including tuberculosis, have responded to therapy, staphylococcal infections have become important because of their notorious development of resistance to the chemotherapeutic agents. The early infantile age group is remarkably susceptible to staphylococcal infections, both mild and severe. The mild staphylococcal infections, those of the skin and superficial organs (furunculosis, impetigo, conjunctivitis, omphalitis, and breast abscesses) are probably the most common infections of early infancy. These infections are important, however mild they may seem, in that they serve as a mode of entry for staphylococci into the body; this entry may facilitate spread to the bloodstream, lungs, meninges or, rarely, bone. The early infantile age group seems particularly susceptible to staphylococcal infections of these organ systems, particularly of the lungs. Recent studies[8,9] have indicated that more than half the cases of staphylococcal pneumonia reported in the pediatric age group occur in infants under six months of age. These factors combine to make staphylococcal disease of prime importance in the pediatric age group.

Our case presented a difficult problem in differential diagnosis from the beginning. Following what is believed to be a completely normal delivery and puerperium, the child first showed evidence of illness at the age of two weeks, when he presented with fever and evident pain in flexion of the leg. At that time, the clinical picture of pain, immobility, and very slight swelling in the leg, suggested the possibility of a congenital disease, such as Caffey's disease. However, the development of the full-blown picture of thrombophlebitis occurred so quickly and typically that the staff overcame their understandable reluctance to make a diagnosis of a disease so rarely found in this age group.

I can offer no hypothesis to account for the development of thrombophlebitis in this case. However, septicemia of the neonatal age group is not uncommon, and it is not unreasonable to assume that the staphylococcal septicemia may have been the result of contamination of the umbilical cord, or a furuncle on the skin which went unrecorded.

During the patient's hospitalization, many members of the staff believed that an abdominal mass would be found to explain the venous stasis which predisposed to thrombophlebitis. This

mass was never found, and at no time in the extensive investigation which was undertaken was there found any clue as to the pathogenesis of the thrombophlebitis.

The collapse of the three vertebrae, occurring as rapidly as it did, suggested three possibilities, first, a rapidly metastasizing malignancy. We believe that a one-year follow-up with complete subsidence of all signs of the disease process has effectively ruled this out. The second possibility, tuberculous osteomyelitis of the vertebral bodies, was a heatedly contested diagnosis among the attending and consulting staff. However, it was thought that the roentgenogram of the chest did not indicate tuberculous involvement of the lungs; that the persistence of a negative tuberculin skin test over a one-year period is almost mutually exclusive to such a diagnosis; that the two-month period of antituberculosis therapy which this child was given was insufficient to arrest permanently the progress of such a disease; that the inability to recover acid-fast bacilli on repeated gastric aspiration, blood cultures, spinal fluid cultures, and even vertebral aspirations, contraindicate this disease.

The diagnosis of acute hematogenous osteomyelitis secondary to the staphylococcal septicemia seems to be the only other tenable diagnosis in this case. First, septicemia resulting from *M. pyogenes* var. *aureus* was demonstrated by blood culture. It was within a few days following this, while the child was still febrile and had a marked leukocytosis, that roentgenographic evidence of collapse of the body of the fourth lumbar vertebra was first seen. The other two vertebral collapses occurred very quickly; and cessation of the appearance of new vertebral collapse coincided with the decline in fever, leukocytosis, and evidence of toxicity. The subsequent regeneration of bone on immobilization occurred during a period of intense antibiotic therapy directed toward the staphylococcal infection. It is felt that these observations substantiate a clinical and laboratory diagnosis of acute hematogenous osteomyelitis secondary to staphylococcal septicemia.

We wish to comment briefly on the difficulty encountered in the anticoagulation process, and suggest that if the rarity of the disease makes diagnosis difficult, it makes treatment even much more so.

ACKNOWLEDGMENT: The author wishes to acknowledge the contributions of Dr. Gordon D. Jensen, now in the Department of Pediatrics, University of Washington, School of Medicine, and Major Harry R. Claypool, Lt. Colonel George N. Austin, and Captain William R. LaRosa, USAF (MC), without whose clinical acumen the child undoubtedly would not have survived.

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INTELLECTUAL ADVENTURE IN MEDICINE

"If anyone deserves to be nominated as a pioneer specialist in gastroenterology, Dr. William Beaumont would head the list. But, in any such discussion, one must not overlook Alexis St. Martin, who likewise contributed to science by permitting the experiments—experiments which caused him some discomfort and mental anguish. That these experiments were not harmful is attested by the fact that St Martin lived to be 76 years of age. He married and reared a family and was a strong, healthy man. When he returned to Quebec from Mackinaw for the second time in 1831, he made the trip in an open canoe via the Mississippi and Ohio Rivers, Lake Erie, Lake Ontario and the St. Lawrence River. The family arrived in Montreal in June, having traveled more than 2,000 miles. Moreover, St. Martin outlived Beaumont by 15 years. . . .The story of Beaumont and St. Martin has been told many times but it bears repeating because it illustrates what can be done when the spirit of inquiry is combined with the spirit of intellectual adventure in medicine."

—CHESTER S. KEEFER, M. D.
in *The American Journal of Gastroenterology*
p. 194, Feb. 1958

Porphyria Hepatica With Primarily Psychiatric Manifestations

JAMES M. BAILEY, *Lieutenant Colonel, MC, USA*
ROBERT B. CARBECK, *Captain, MC, USA*

THIS case is presented as a reminder that a significant number of psychiatric conditions have an organic cause. The non-psychiatrist, when confronted with severe psychiatric symptoms, is apt to immediately assume that they are psychogenic and to promptly refer the patient to a psychiatrist. The less severe symptoms, which usually are passed off as "neurotic," are so frequent and so commonly psychogenic that only a feeble attempt is made to rule out an organic cause. One such cause is acute intermittent porphyria. This condition certainly is not as rare as is generally believed, and must be kept in mind as the possible cause of psychiatric conditions of all severity. In Sweden, where porphyria has attracted a great deal of attention among physicians, incidence of acute intermittent porphyria is 1.5/100,000.[1]

A patient was sent to us with a diagnosis of schizophrenic reaction, paranoid type. Because the possibility of an organic cause was kept in mind, the diagnosis was readily made and proper management instituted.

CASE REPORT

The first indication of major psychopathology in this 39-year-old white man occurred in the spring of 1956. This consisted of a paranoid delusion concerning his commanding officer and was so intense that he went to the Office of Special Investigation concerning it. The patient stated that following this, everything went well for about one year. In April and May 1957, the patient smelled exhaust fumes when driving in his car and believed that his neighbor was trying to kill him. In mid-May he consumed three fifths of whisky over a four-day period and ate poorly during this time. During and following this episode his paranoid delusions spread and became more severe. He was nauseated and vomited once. On direct questioning, he admitted that he had diffuse, crampy, lower-abdominal pain during this episode. On the day following this episode, he experienced auditory hallucinations and tremors, and was seen by a physician who gave him sedation.

From Valley Forge Army Hospital, Phoenixville, Pa.

His hallucinations disappeared, but he became even more anxious over the next eight days and was sure someone was going to kill him. He was then hospitalized for 17 days and stated he was in a fog the first five days. At the time it was thought the episode was caused by alcoholism. It was recommended the patient join Alcoholics Anonymous, which he did.

The patient denied ingestion of any alcohol subsequent to his hospitalization in May 1957. He joined Alcoholics Anonymous and attended faithfully until December. He was given phenobarbital, ¼ grain four times a day for nervousness, beginning in July 1957. In spite of this he had episodes of fairly severe anxiety. He stopped the medication for four days and stated he felt better during this period, but nevertheless resumed the medication.

In December he stopped going to Alcoholics Anonymous, and developed paranoid ideas concerning the director of the local Alcoholics Anonymous chapter. On 31 January 1958 he became very anxious, developed a severe bilateral frontal headache, and began crying while at work. He was sent to the dispensary, where he was given promazine hydrochloride, 25-mg tablets, to be taken four times a day, and sent home. The phenobarbital was discontinued at that time. While at home he became very anxious and was sure someone was trying to kill him. He developed crampy, lower abdominal pain, and cramping pain in all four extremities. On 8 February his sensorium became clouded, and he remembered very little that happened from then to 10 February, but he did remember seeing robots on his front lawn. According to other sources, he became increasingly agitated during that period. He was seen by a physician on 10 February, and was described as being acutely excited, with visual and auditory hallucinations; rambling wildly and verbalizing many paranoid delusions. The patient stated that the following day, while in the hospital, he noted weakness of the right ankle and pain in the distal part of the right leg. He was transferred to this hospital on 12 February, with a diagnosis of paranoid schizophrenia, chronic, severe.

On direct questioning, the patient remembered two other episodes of confusion and agitation, plus crampy, lower abdominal pains. The first occurred in 1927 following ingestion of home-brew. The second episode occurred when the patient had infectious hepatitis in 1950. The family history was incomplete and noncontributory.

On mental examination the patient was extremely co-operative and anxious to please. He was oriented and his memory was intact. His affect was grossly normal and his thought-production and stream of thought were good. He revealed many paranoid delusions which were not fixed but changed readily and were concerned with the cause of his psychotic episode. He denied hallucinations since 11 February. The remainder of the physical examination was entirely within normal limits.

During his hospital stay, the patient continued to have various paranoid delusions, mainly concerning the cause of his illness. His admission urinalysis, hemogram, serology and roentgenogram of the chest were within normal limits. Because he had good affect, related well, and showed no evidence of a thinking disorder, it was believed that his condition was not schizophrenia. The history of the cloudy sensorium and vivid visual hallucinations strongly suggested an organic cause. This, plus the history of crampy, lower abdominal pain, brought up the possibility of acute intermittent porphyria. A Watson-Schwartz test performed on 20 February was positive, indicating the presence of porphobilinogen. Clinically the patient remained about the same. Liver-function tests revealed alkaline phosphatase, cephalin flocculation, thymol turbidity, and Bromsulphalein retention, all well within normal limits. Repeat tests on the urine, on 25 February, were positive for porphobilinogen, but were negative on 26 February. The patient was placed on chlorpromazine hydrochloride, up to 100 mg four times a day, without apparent effect on his clinical course, and the drug was therefore discontinued after one week. The urine was again positive for porphobilinogen on 7 and 10 March, but only slightly positive on 14 and 18 March. During this time the patient showed a gradual clinical improvement. On 24 March a positive test for porphobilinogen was obtained, but the urine has been negative on 14 different days since then. By 1 April, all evidence of his paranoid psychosis had disappeared. At no time during his hospitalization here did he experience abdominal pain, myalgia, paresis, or neuritic pain as he had just prior to his transfer to this hospital. He was returned to duty with a statement of the diagnosis, and the importance of avoiding alcohol, barbiturates, or sulfonamides. He was advised to carry a copy of that document with him at all times.

DISCUSSION

Porphyria is an inborn error of metabolism and, specifically, a disturbance in porphyrin metabolism resulting in the production of abnormal amounts of porphyrins and porphyrin precursors. Associated with this metabolic defect, a variety of clinical manifestations are usually found.[2] Until recently, the classification of porphyria has been chaotic and based solely on clinical manifestations. Recent work[3] has resulted in a more fundamental classification, which is based on the site at which the abnormal metabolism occurs. In this classification there are two major subdivisions, porphyria erythropoietica and porphyria hepatica. In the former, excessive and abnormal porphyrin formation occurs primarily in the bone marrow. Physical manifestations are early photosensitivity, increased hemolysis and erythropoiesis, and splenomegaly. In porphyria hepatica, as the name implies, excessive and abnormal formation of porphyrin, porphyrin precursors, and related compounds are found in the liver. This latter group is further subdivided into three groups based on clinical manifestations. The cutanea tarda type is characterized

by photosensitivity occurring late (adulthood). The second group is the acute intermittent type, into which this case presentation falls. This is the most common type of porphyria. The third is the mixed type, in which photosensitivity occurs with intermittent abdominal or nervous manifestations or both. Latent porphyria hepatica, in which chemical abnormalities are found in the absence of clinical manifestations, is being encountered with increasing frequency.

As the name implies, acute intermittent porphyria is characterized by individual attacks of varying lengths of time, and with varying periods of remission. The major manifestations fall into three categories: Abdominal, neurologic, and psychiatric. The abdominal manifestations are pain, which is usually diffuse, colicky, and severe; constipation, which may be so severe as to mimic bowel obstruction; and nausea and vomiting. Under neurologic manifestations we find peripheral neuropathy, characterized by pain and paresis, or actual flaccid paralysis. This is most common in the lower extremities and is not symmetrical. Paralysis of trunk muscles is much less common, but paralysis of the respiratory muscles is a fairly common cause of death in these patients. In more severe cases bulbar involvement may occur.[2] Most commonly, the psychiatric manifestations are irritability and anxiety. These coupled with the "atypical" abdominal complaints, are usually interpreted as indicating emotional illness. The patient may then become psychotic, which seems to confirm this diagnosis. "Organic" signs are present, such as confusion and disorientation, but additional symptoms may mask these and make the physician think of a schizophrenic process. Visual hallucinations, when present, are of the type seen by "organic" patients, and may be accompanied by auditory hallucinations.[4] Other manifestations such as temperature elevation, leukocytosis, tachycardia, and hypertension are also occasionally seen, which also confuses the picture. The urine is classically described as port-wine in color, either as voided or on standing. This color is greatly overemphasized and is not always present.

It has been shown by several workers that certain chemicals such as the barbiturates,[5] ethyl alcohol,[2] and sulfonamides may precipitate an attack. Porphyria hepatica is inherited as a Mendelian dominant, and may be latent, or manifested clinically as either the acute intermittent, cutanea tarda, or mixed type.[6]

Diagnosis depends on the suspicions of the clinician, based on the clinical manifestations. A good but simple laboratory procedure is to check the urine for porphobilinogen by the Watson-Schwartz test. A positive test is almost pathognomonic of porphyria. Porphobilinogen has been found in a few instances of Hodgkin's disease, carcinomatosis, systemic sporotrichosis, and hepatic cirrhosis without clinical manifestations of porphyria.[2]

Quantitative tests for coproporphyrin and uroporphyrin may be performed, but such tests are not widely available.

Treatment of the acute episode is solely supportive. Paraldehyde or chloral hydrate may be prescribed for restlessness, and opiates or synthetic analgesics, such as Demerol Hydrochloride, for pain. Barbiturates, ethyl alcohol, and sulfonamides are contraindicated during the acute attack and at any other time. Recently, it has been found that with chlorpromazine hydrochloride therapy there is a disappearance of pain and nervous symptoms. There was, however, no effect reported on established paralysis.[7] In our case, it is very possible that the phenobarbital the patient took from July through January precipitated his recent attack.

SUMMARY

A case of porphyria hepatica, acute intermittent type, with predominantly psychiatric manifestations, has been presented as a reminder that this and other organic conditions may occur in such a manner. The clinical manifestations and treatment have been briefly discussed.

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"There is evidence that, in struma lymphomatosa, the liver and spleen may become abnormal: in 1 patient advanced cirrhosis of the liver developed. The abdomen should be carefully examined in possible cases of struma lymphomatosa, because a palpable spleen supports this diagnosis."

—REGINALD W. LUXTON, M. D.
R. T. COOKE, M. D.
in *Lancet*
p. 108, July 21, 1956

Diabetic Acidosis With Transient Renal Insufficiency

CHARLES E. SHIELDS, *First Lieutenant, MC, USA*

DIABETIC ketosis may produce a hypotensive state which in turn can occasionally induce oliguria or anuria.[1,2] Reported cases have been characterized by laboratory evidence of acute renal insufficiency, *i. e.*, azotemia and hyperkalemia. Renal suppression may be so marked that hemodialysis is required.[3]

This case report is of interest in that transient oliguria occurred in a diabetic who had not experienced hypotension during recovery from a mild episode of ketosis, and in whom there was no evidence of exposure to nephrotoxic agents, but who did demonstrate electrocardiographic and biochemical evidence of hypokalemia. Restoration of normal urinary output followed electrolyte replacement.

CASE REPORT

A 32-year-old woman, para 3, gravida 4, who had been diagnosed 12 years previously as a diabetic, was admitted to this hospital on 9 January 1958 after a 24-hour period of anorexia and intermittent nausea and vomiting. Following institution of insulin in 1946, progressive increase in dosage had been required, and 60 units of neutral protamine Hagedorn insulin (NPH) had been administered daily since 1947. Three previous pregnancies had been associated with ketosis, resulting in a stillborn infant in the second trimester of the first pregnancy. The younger of two surviving children is mentally retarded. The current pregnancy had been uneventful, except for an alleged attempt to induce abortion with quinine three months before the present hospitalization.

Past history was significant in that the patient had been hospitalized for right upper lobe pulmonary tuberculosis in 1954. Following drug therapy, she had been subjected to lobe resection, from which she had recovered without incident. A gastrointestinal series, following retrosternal and subxiphoid pain had been reported as positive for hiatus hernia. There was no familial history of diabetes mellitus. The patient was normotensive.

From Valley Forge Army Hospital, Phoenixville, Pa. Capt. Shields is now assigned to Tripler Army Hospital, APO 438, San Francisco, Calif.

Examination on admission revealed an acutely ill patient who was conscious and able to answer questions lucidly. Her blood pressure was 120/78 mm Hg; temperature, 98.4°F; pulse rate, 88 per minute; respirations, 22 per minute and normal. Other than dryness of the mucous membranes there was no significant evidence of dehydration. Additional findings were the presence of scattered rales at both lung bases; uterine enlargement compatible with a six-month gestation; 1 plus pitting pretibial edema; and essentially normal fundi. The remainder of the examination was unremarkable.

Routine urinalysis showed 3 plus albuminuria, 4 plus glycosuria, and ketonuria. The reaction was acid with a specific gravity of 1.015. Microscopic examination of urinary sediment showed 6 to 8 white blood cells, occasional erythrocytes and granular casts per high powered field. Blood glucose was 193 mg per 100 ml; CO_2 combining power, 17 mEq per liter; serum chlorides, 103 mEq per liter; serum ketones were positive in a 1:12 dilution. Blood cell count revealed a leukocytosis of 16,700 per μl, and a hemoglobin of 13.7 grams per 100 ml, but was otherwise within normal limits. A cardiolipin microflocculation test was negative. A roentgenogram of the chest showed absence of the right fifth rib, and elevation of the right leaf of the diaphragm was noted without evidence of active pulmonary parenchymal disease. The electrocardiogram demonstrated changes consistent with hypokalemia (fig. 1). Other pertinent laboratory data are noted in table 1.

During the night of admission the patient had hematemesis; her blood pressure remained in a normotensive range. Urinary output was initially 60 to 80 ml per hour. Therapy during the first 12 hours consisted of penicillin given parenterally, a total of 150 units of regular insulin, 2 liters of 0.9 per cent sodium chloride solution, and 2 liters of 5 per cent dextrose in water. Output during the same period was 720 ml of vomitus and 640 ml of urine. Although responsive, the patient was unco-operative in taking fluids or medication orally.

The morning after admission the urinary output decreased to 5 to 10 ml per hour. Physical examination at that time revealed improvement of hydration as evidenced by moistness of the mucous membranes, good tissue turgor, and moist axillas. However, an increase in basilar rales and associated tachycardia of 130 to 140 resulted in the decision to digitalize the patient intravenously. Clinical improvement, manifested decreasing pulmonary congestion and slowing of the pulse ensued. Oral digitalis maintenance was continued until the fifth hospital day.

Because of electrocardiographic evidence of hypokalemia and a serum potassium of 2.8 mEq per liter, it was elected to administer 60 mEq of potassium chloride by infusion despite the presence of urinary suppression. Combined output during a 31-hour period of oliguria was 990 ml (380 ml of urine and 610 ml of vomitus). Intake by parenteral and oral routes totaled 1,490 ml. Emesis gradually abated, either spontaneously or partially in response to intravenous

administration of pyridoxine hydrochloride. At the expiration of 31 hours diuresis suddenly occurred with urinary output of 200 to 225 ml per hour.

Two urine cultures were positive for beta hemolytic streptococci and *Micrococcus pyogenes* var. *albus*, respectively. Toxicologic analyses of feces, urine, and blood were negative. Antistreptolysin was 250 Todd units and the C-reactive protein was negative.

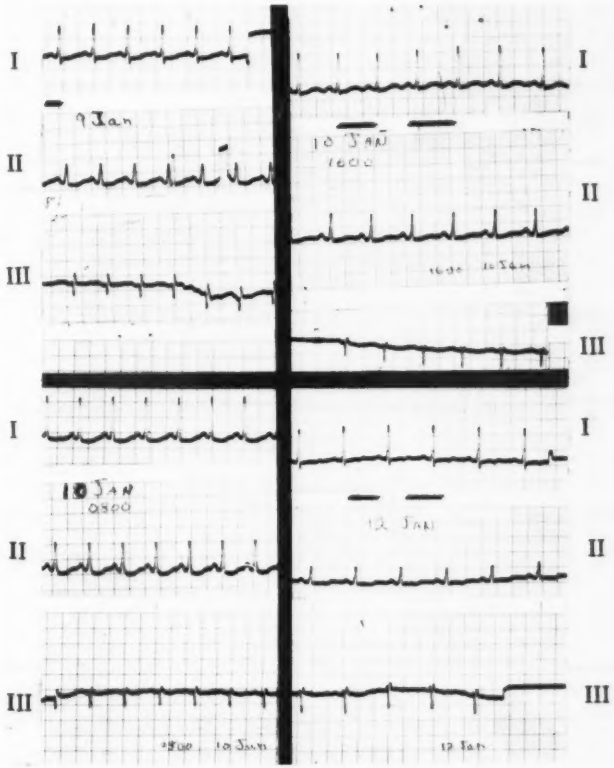

Figure 1. Electrocardiogram demonstrating changes consistent with hypokalemia.

Electrocardiograms obtained simultaneously with blood chemistry studies revealed hypokalemia (fig. 1 and table 1). During this time there was no other significant electrolyte imbalance, nor nitrogen retention. The electrocardiogram returned to normal, paralleling biochemical improvement. Urinalyses demonstrated persistent albuminuria, pyuria, and cylindruria with occasional microhematuria. Urinary specific gravities ranged from 1.007 to 1.020.

TABLE 1. *Laboratory data*

Fluid balance						Blood chemistry studies						
Date	Intake	Urine	Emesis	Output	Time	Glucose (mg/100 ml)	BUN (mg/100 ml)	Bicarbonate (mEq/l)	Sodium (mEq/l)	Potassium (mEq/l)	Chloride (mEq/l)	Acetone (mg/100 ml)
1/9/58	3100	540	510		2400	193		17			103	1:12
		540	720	1260								
	In 12 hours											
1/10/58		580	810	1390	0400	193		18				1:8
	In next 31 hours with 60 mEq KCl at start of the day				0800		18	24	134	2.9	98	1:4
					1100			21	138	2.7	96	1:2
					1200	140	22	27.6	139	2.8	100	
					1400	137	20.5	25	137	3.3	98	neg
					1800	140	20	27		3.7		neg
1/11/58	After diuresis began				0800	140	22.4	27.6	139	2.8	100	neg
	3290	1445	1115									
	Blood given 500 ml		total	2560	2200	300		28				1:6
1/12/58	2975	765	425	1190	0800	93	21	30.2	146	3.6	95	neg
1/13/58	2390	940		940	0800	168	15	26	142	3.2	108	1:4

Once diuresis occurred, the patient's course was uneventful, except for a brief recurrence of ketonuria and ketonemia. Administration of regular insulin and augmentation of fluid intake produced amelioration. Five hundred milliliters of whole blood were administered because of a hemoglobin of 10.7 grams per 100 ml. Blood loss was thought secondary to a possible esophagitis. Urinary output was well maintained, and oral intake rose to 2 liters daily. The patient was subsequently placed on an 1,800 calorie diabetic diet. Interval insulin dosage was dictated by the degree of glycosuria or hyperglycemia. She was discharged to an outpatient status on a regimen of 35 units of NPH with 5 units of regular insulin in the morning and 5 units of NPH in the evening. The subsequent prenatal period was uneventful, and the patient delivered a viable 8-pound baby girl on 9 March in the thirty-fifth week of pregnancy. In the immediate postpartum period, diastolic blood pressures, averaging 100 mm Hg, were demonstrated.

Comment. Analysis of initial fluid replacement following admission of this patient would indicate that excessive amounts of sodium chloride were administered. There is a good possibility that hyperosmolarity was induced by excessive administration of sodium chloride. The delay in administration of potassium undoubtedly potentiated the pathophysiologic shift of this ion from the intracellular to the extracellular compartment and its subsequent diuresis. More liberal administration of water might have aborted the oliguric episode described in the case report.

DISCUSSION

Historically, there was no evidence in this patient of hypotension, documented renal disease, toxemia of pregnancy, hemolysis or obstructive uropathy. Toxicologic investigation was negative. The sudden onset of oliguria initially suggested acute renal damage, but subsequent restoration of urinary concentrating ability and the absence of bacteremia and fever would tend to exclude such profound insults as necrotizing papillitis[4] or cortical necrosis.[5,6] Reflex anuria seemed unlikely because of the experimental documentation that such urinary suppression rarely exceeds 80 minutes.[7]

In replacement therapy for acidosis without concomitant administration of potassium there is an intracellular shift of sodium with displacement of the former ion.[8] Rahman[9] and Cannon[10,11] and their associates question whether increased intracellular sodium may not impede re-entry of potassium into the cell. Elkinton, Winkler, and Danowski[12] demonstrated that only by the administration of exogenous potassium was there adequate repletion.

Inasmuch as potassium will favor sodium retention, chronic hypokalemia will lead to interference with tubular function in the conservation of electrolytes and water.[9] In the study of

chronic potassium deficiency induced by purgation, Schwartz and Relman[13] demonstrated that restoration of potassium to normal levels resulted in sodium retention. Investigation of patients, included in another study,[14] revealed impaired glomerular and tubular function with decreased clearances and isosthenuria, which ultimately responded to potassium replacement. It has been the impression of other workers[15] that renal concentrating ability was impaired only when hypotension was present. They did concede, however, that hypokalemia could alter tubular function.

Potassium deficiency is frequently associated with permanent histologic abnormalities involving the liver, pancreas, skeletal muscle, myocardium, and kidneys.[6, 16–19]

Evaluation by standard electrophotometric technics may reveal normal, depressed, or elevated potassium values, unrelated to the total body concentration of this ion.[16, 20–25] A diabetic in ketosis has diminution in extracellular volume with increased serum electrolyte concentration which does not accurately reflect total body concentration.[16, 23] Studies utilizing radioactive potassium (potassium 42) have demonstrated that a loss of one third of the body's potassium may coexist with serum levels of 8 mEq per liter.[24]

Moderate hypokalemia frequently occurs in the therapy of diabetic ketosis because of dilution and intracellular migration of that ion. Balance studies have shown this relative deficiency, and replacement therapy at the time of the observation has aided in the correction of acidosis and metabolic imbalance.[16, 21, 24, 26, 27] Bland[16] emphasized that potassium can be decreased intracellularly before electrocardiographic, biochemical, or clinical changes become manifest. To demonstrate hypokalemia several hundred mEq must be lost.

The apparent cause and effect relationship in the patient described would indicate that potassium imbalance was directly related to urinary suppression.[14] The absence of stigmata of acute renal failure, post diuresis would imply that this chain of events was not in operation. The presence of albuminuria and abnormal urinary sediment suggest that antecedent renal disease may have been present in this patient before the acute illness; though these findings may be found, and thereby possibly be part of, the renal pathophysiology of potassium depletion.[14]

SUMMARY

A case of diabetic ketosis occurring in a 32-year-old woman without known antecedent renal disease is presented. During therapy a 31-hour period of oliguria occurred. Diuresis and recovery followed the administration of potassium chloride. It has been emphasized that transient renal insufficiency may

have had its inception secondary to the induced hypernatremia and concomitant hypokalemia. Various pathophysiologic and experimental data have been submitted to support this thesis.

ACKNOWLEDGMENT: The author wishes to thank Major George B. Hamilton, MC, USA, for his assistance in the preparation of this article.

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REDUCTION OF AUTO-PEDESTRIAN COLLISIONS

"Further reduction in auto-pedestrian collisions can come only from a general recognition and acceptance of the physical circumstances involved. Intensified educational efforts must be made to enlighten pedestrians (and all drivers are occasionally pedestrians) relative to the physical facts which can spare them injury or death. Pedestrians must learn that vehicles are deadly, high energy objects. They must also learn that every vehicle in motion carries a collision zone which expands with speed; and should they enter such a zone at the wrong time, or dwell in one for more than a brief interval, injury or death is almost certain regardless of the actions of the driver. They must also recognize the visibility limitations of drivers. Car manufacturers should be encouraged to provide windshields of the highest possible light transmittance. They should also contribute to pedestrian safety by reducing the injury potential of external ornamentation. Dangerous ornamentation should be abolished by uniform traffic legislation. The language of pedestrian right of way laws should be reconsidered, having in mind that the laws of physics dominate all collisions. Finally, the integrated patterns of these collisions lead to one simple conclusion: The only time a pedestrian can safely exercise his right of way is *after* vehicles have stopped, not *before*."

—WILLIAM W. HARPER
in *Arizona Medicine*
p. 272, Apr. 1958

Pericarditis Preceding the Clinical Recognition of Pneumococcal Pneumonia

PERRY B. MILLER, *Major, USAF (MC)*
NEWTON D. SCHERL, *Captain, USAF (MC)*

PNEUMOCOCCAL PERICARDITIS, a once dreaded complication of pneumococcal pneumonia, has become relatively rare since the advent of antibiotic therapy.[1-4] The quick response of pneumococcal pneumonia to penicillin and other antibiotics prevents the entrance of the organism to the pericardium, especially because the most common preceding event, the development of empyema with subsequent direct spread to the pericardium, is forestalled.[2]

Levine[2] emphasized that pericarditis occurring with pneumonia is (1) not a common complication of pneumonia; (2) occurs almost exclusively in those cases of pneumonia complicated by empyema, especially empyema of the left pleural cavity; and (3) occurs most often late in the disease.

In the following case an unusual sequence of events was observed in which, at a time when physical examination and a roentgenogram of the chest revealed normal pulmonary findings, a pericarditis was diagnosed by the presence of a pericardial friction rub and compatible electrocardiographic changes, only to be followed 24 hours later by the clinical demonstration of a pneumococcal pneumonia.

The clinical course observed in this patient is being reported because no mention of the appearance of pericarditis before the development of pneumococcal pneumonia could be found in the standard textbooks of medicine, cardiology, and pathology consulted.[1-6]

CASE REPORT

A 20-year-old man was admitted to this hospital on 5 March 1958, complaining of mild lower anterior chest pain aggravated by deep inspiration; the pain had been present for twenty-four hours. He had

From 7373d U. S. Air Force Hospital, APO 10, New York, N. Y. Major Miller is now assigned to U. S. Air Force Hospital, Eglin Air Force Base, Fla.

experienced weakness, anorexia, and nausea on the day of admission. There was no history of cough, chills, or known fever.

Physical examination on admission revealed no abnormalities except for a minimal temperature elevation to 99.4°F.

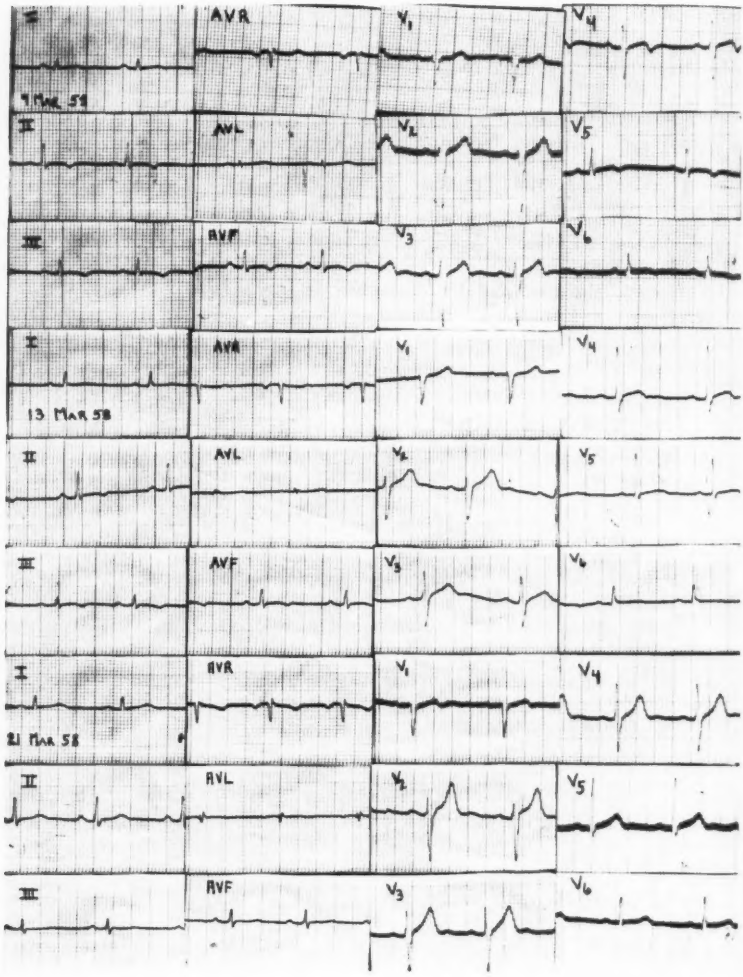

Figure 1. 7 March 1958: *Initial electrocardiogram. Coved T-wave inversions are seen in leads II, III, aVF, and V_4-V_6. T wave upright lead aVR.* 13 March 1958: *The T-wave changes are less marked and reveal a return toward normal.* 21 March 1958: *Normal electrocardiogram.*

The initial white blood cell count showed 15,000 cells per μl, with 92 per cent neutrophils. The hemoglobin was 13.4 grams per 100 ml. The urinalysis was negative. A roentgenogram of the chest was negative.

On 6 March the patient had a marked rise in temperature to 105°F. A complete physical examination again revealed no abnormalities. Several blood cultures drawn at this time were found subsequently to be negative.

On 7 March a faint pericardial friction rub was heard over the third intercostal space at the left parasternal line. This was best heard with the breath held midway in the respiratory cycle and could not be heard with either full inspiration or full expiration. An electrocardiogram revealed the presence of coved T-wave inversions in leads II, III, aVF, and leads V_4-V_6. The T wave was upright in lead aVR (fig. 1). Physical examination of the lungs again revealed no abnormalities and a repeat roentgenogram of the chest was negative. The patient had continued to complain only of slight anterior chest pain. His temperature graph showed a spiking course varying from 99.6° to 104.8°F.

On 8 March bronchial breath sounds were audible and pectoriloquy was present below the angle of the left scapula. A roentgenogram of the chest revealed pneumonia in the apex of the left lower lobe (fig. 2). A white blood cell count showed 26,750 cells per μl, and the differential count revealed 92 per cent neutrophils. The patient was now coughing, and a sputum culture revealed *Diplococcus pneumoniae*. At this time the pericardial friction rub was more prominent than on the preceding day and could be heard in all phases of respiration. Crystalline potassium penicillin G was given in a dosage of 180 mg (300,000 units) intramuscularly every 3 hours for 4 doses. Procaine penicillin G was given in a dosage of 600 mg (600,000 units) intramuscularly every 12 hours.

On the following day, 9 March, the patient's temperature fell, with a maximum spike to 101.8°F. The pericardial friction rub was still audible.

On 10 March the friction rub could no longer be heard although electrocardiographic changes were still present. The patient became afebrile and asymptomatic on this day and remained so until discharged on 19 March. An electrocardiogram taken on 13 March revealed marked improvement with a return of the previous T-wave inversions toward normal (fig. 1).

A roentgenogram of the chest, on 17 March, demonstrated complete resolution of the pneumonia. A normal electrocardiogram was obtained on 21 March, two days after discharge (fig. 1).

Figure 2. Roentgenogram, 8 March 1958, revealing pneumonia in the left lower lobe.

DISCUSSION

This case presented the problem, first, of a fever of undetermined origin, and then, of a pericarditis of unknown cause until the development of a classical pneumococcal pneumonia gave the key to the cause and indicated therapy for the disease.

The fact that the friction rub, when first discovered, could be heard only in the mid-phase of respiration would argue for the diagnosis of a pleuropericardial friction rub rather than a pericardial friction rub (and, indeed, a pleurisy likely was present), but at that time the findings of electrocardiographic changes compatible with a pericarditis, and the subsequent development of a pericardial friction rub uninfluenced by respiration, indicate that pericarditis was present. In all probability, the infection first developed in a pulmonary focus adjacent to contiguous pleura and pericardium, with subsequent spread to the pleura and then to the pericardium. Probably, there was a delay in the

involvement of a greater area of lung which prevented the clinical and roentgenologic diagnosis of pneumonia until after the signs of pericarditis had become manifest.

Before the onset of the pneumonia, the principal diagnosis considered was acute benign pericarditis. Acute benign pericarditis may be accompanied by high fever, leukocytosis, and virus pneumonia.[7] The similarity of the clinical picture as seen in this case to that seen in some cases of acute benign pericarditis indicates the possibility of difficulty in the differential diagnosis of the two diseases.

Steroid therapy has been reported to cause amelioration of the clinical course of acute benign pericarditis.[8-10] This case illustrates the need for caution in the giving of steroid therapy too early in the course of what appears to be acute benign pericarditis, since the diagnosis may be in error and the steroid therapy contraindicated for the actual disease present.

SUMMARY

In a patient with pericarditis, of apparent pneumococcal etiology, the unusual clinical picture of pericarditis preceding the clinical recognition of pneumococcal pneumonia was observed. Penicillin therapy resulted in prompt subsidence of the pericarditis and resolution of the pneumonia. The similarity of the clinical findings to some cases of acute benign pericarditis is discussed.

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Wallenberg's Syndrome Resulting From Hemorrhage

ARTHUR J. LEVENS, *Lieutenant Colonel, MC, USA*
FRANK W. KIEL, *Captain, MC, USA*

WALLENBERG'S SYNDROME results from destruction of the lateral medullary region of the brain stem with subsequent distinct symptoms and neurologic deficits. Although it is commonly attributed to cerebral thrombosis, other mechanisms such as metastatic tumor, tuberculoma, and chiropractic manipulation have been incriminated. Recently a patient was encountered who presented a Wallenberg's syndrome resulting from hemorrhage, a cause not clearly defined in this syndrome.

CASE REPORT

A 34-year-old Latin-American paint sprayer was referred to this hospital on 7 July because of occipital pain and vertigo of three days' duration.

On the evening of 4 July he had had an abrupt onset of severe left occipital pain, followed shortly thereafter by vertigo, difficulty in swallowing, and a staggering gait with falling to the left. He was examined the next day and his difficulties were attributed to a sore throat. After admission to another hospital, signs of bulbar and facial paralysis were detected. Cerebrospinal fluid examination revealed clear fluid showing no cells, and a total protein of 27 mg per 100 ml. He was transferred to this hospital for isolation and possible respirator therapy.

Past history revealed hypertension, discovered nine years before when he was refused as a blood donor because of high blood pressure; he was never treated, and levels of blood pressure were not known. With the exception of an occasional sore throat, he reported no other illnesses.

The patient was a well-nourished, asthenic individual, apprehensive and in acute distress. His temperature was 101.2°F; pulse rate was accelerated; respirations were noisy from pharyngeal pooling of secretions; blood pressures showed 130 to 160/70 to 110 mm Hg. The patient's head was symmetrical with no evidence of trauma. Examination of the eyes revealed round, regular, very small (0.1 cm) pupils which reacted to light and accommodation; fundus examination was

From Brooke Army Hospital, Fort Sam Houston, Tex.

unsuccessful. The oropharynx was injected, but no exudate or membrane had appeared. The lungs were normally resonant. The heart was not enlarged and had a regular rhythm without murmurs. Abdominal examination disclosed no abnormalities. Homans' sign was negative bilaterally.

Neurological examination findings were as follows. Cranial nerves: I—not tested. II—intact. III, IV, VI—intact. V—anesthesia to hot and cold of the right side of the face, with left side of face normal; findings reversed themselves 12 hours after admission. VII—complete peripheral facial paralysis on the left; no taste bilaterally on anterior tongue to alcohol. VIII—nystagmus to the left, plus vertical component; patient fell to the left with subjective external vertigo to the right when standing; audition normal. IX—left palate hanging with poor gag reflex. X, XI, XII—dysphagia, protrusion of tongue to left, intact sternocleidomastoids, head held to right, voice deep and hoarse. Cerebellar signs: Positive Holmes's rebound phenomenon on left; moderate finger-to-nose dysmetria on the left; poor ankle-to-knee motions bilaterally; adiadochokinesis on the left. Sensory: Hemihypesthesia with no hot or cold differentiation on the right below the clavicles. Deep tendon reflexes were present, with the right upper extremity hyperactive; superficial reflexes were absent; plantar responses were normal.

Hemoglobin was 14 grams per 100 ml. Hematocrit was 43 per cent. The white blood cell count was 11,000 per μl, with 80 per cent neutrophils, 16 per cent lymphocytes, 3 per cent monocytes, and 1 per cent basophils. Urinalysis was normal. Cholesterol was 321 mg per 100 ml; blood urea nitrogen, 18 mg per 100 ml; blood glucose, 68 mg per 100 ml. Cerebrospinal fluid on the fifth hospital day was xanthochromic, with 2,600 red blood cells per μl, plus 5 lymphocytes per μl; Pandy's test was slightly positive; total protein was 53 mg per 100 ml.

For the first 36 hours the patient's respirations were normal. A prophylactic tracheotomy was performed and a moderate amount of mucopurulent material was aspirated from the bronchi. Large amounts of penicillin and streptomycin sulfate were given; morphine was administered every 6 to 8 hours; anticoagulants were not used.

On 9 July the patient suddenly became cyanotic and completely flaccid; after five hours in a respirator he was able to breathe adequately. Subsequently, left chest motion ceased, until bronchoscopy aspirated a large mucus plug. Several more cyanotic episodes occurred, with death ensuing during the morning of 12 July.

Autopsy Findings

At autopsy the only significant finding besides his bronchopneumonia was in the brain. The brain weighed 1,275 grams. The cerebral hemispheres were symmetrical; their gyri were not flattened and the sulci were of the usual width. The brain stem appeared distorted, with the medulla measuring 3.2 cm in width, being swollen to the size of the pons. The whole medullary region was soft; hemorrhage appeared on the lower surface of the left side of the medulla (figs. 1 and 2). In the

interior of the medulla oblongata a massive hemorrhage involved nearly the entire left half, sparing only the lower olive and the lateral restiform body; furthermore, it extended across the midline to compromise the contralateral medullary structures (fig. 3). Additional blood was seen above the roof of the medulla in the region of the fourth ventricle,

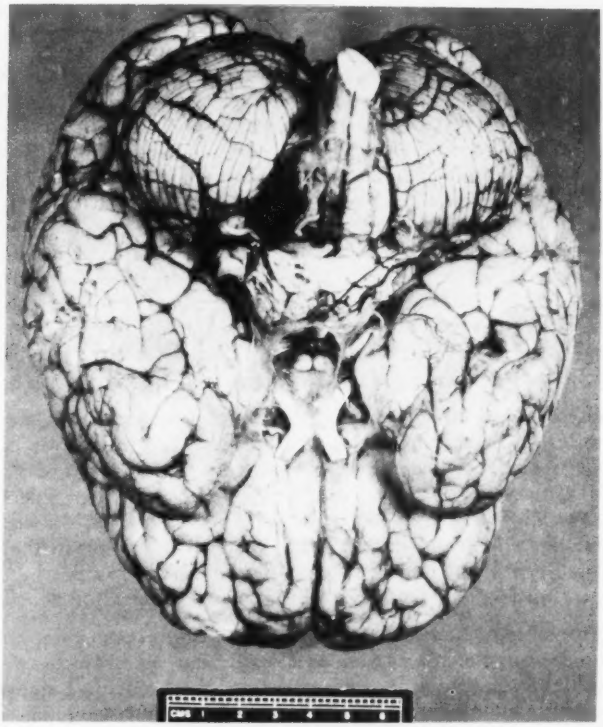

Figure 1. View of brain showing bulging hemorrhage in left medullary region.

and also accumulated on the posterior cerebellar poles. The cervical spinal cord below and the brain stem above the involved medullary region were normal. Blood vessels at the base of the brain were structurally intact, including the beginning parts of the posterior inferior cerebellar arteries.

CLINICOPATHOLOGIC CORRELATION

Several aspects of this case deserve emphasis, including the classic features of Wallenberg's syndrome.[1-7] The initial complaint of sudden headache with vertigo is duplicated in other reported cases. Twenty-seven of the 28 patients reported on by Lewis, Littman, and Foley[8] had an acute onset of sudden dizziness and headache. In the remaining patient these symptoms

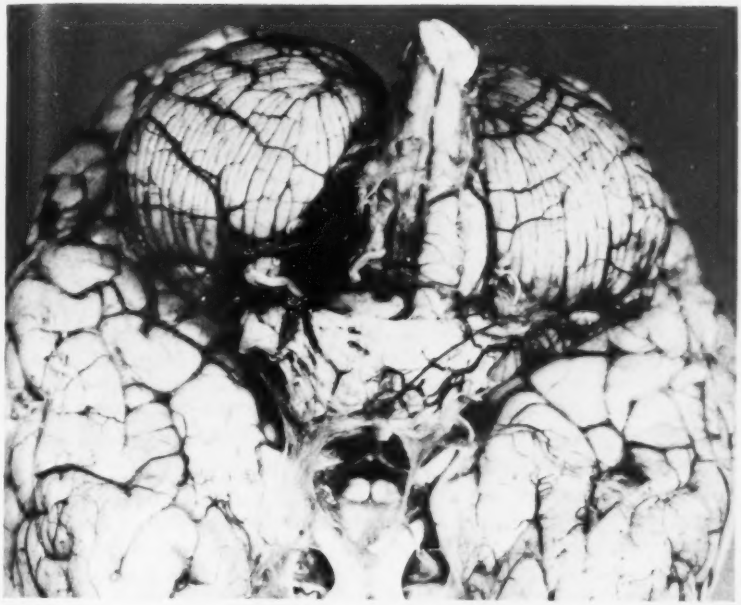

Figure 2. Close-up of figure 1.

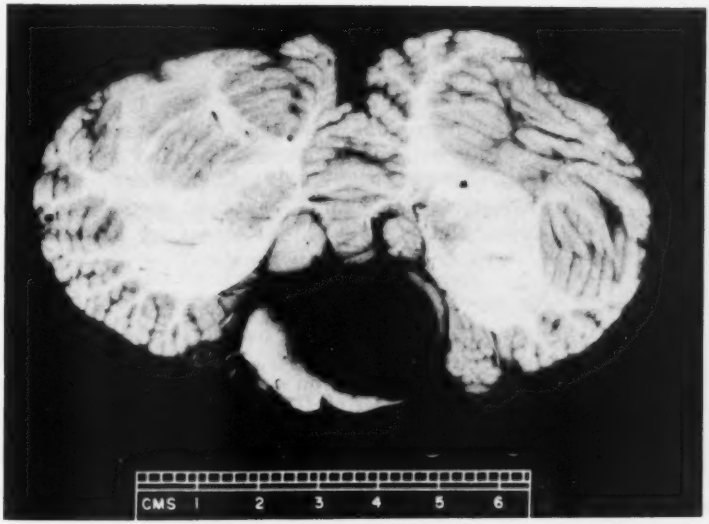

Figure 3. Cut section of brain stem showing massive medullary hemorrhage, diffusing to opposite side.

developed gradually over a period of several hours. In other instances, the onset is similar to that of Ménière's syndrome with headache and dizziness, nausea, and vomiting.[9]

A point often overlooked in the usual description of this disease is the common occurrence of facial weakness[6] on the same side as the lesion, which can be affected by involvement of the 7th nucleus, with its long spread from the 3d nucleus to the 12th nucleus.[3,10] In the series of Lewis, Littman, and Foley, 19 of 28 patients developed this sign. The fact that the hypalgesia of the face is at first on the right, contralateral to the proposed lesion on the left, is not inconsistent, for this may result from involvement of secondary trigeminal fibers which have coursed over to the side of the lesion. The reversal of the anesthesia to the left side of the face, the same side as the lesion, can be attributed to extension of the process to involve the descending tract of the 5th nerve, with probably decreased edema of the crossed trigeminal fibers.

A vertical nystagmus almost always means brain stem involvement, situated in the vermis, cerebellum, or superior vestibular nucleus.[5] However, it is on looking to the side of the lesion that nystagmus in this disease is most pronounced. Nucleus ambiguus involvement is seen as the dysphagia, the dysarthria, and hoarseness. However, the absent gag reflex once again implicates the descending 5th nucleus. The contralateral sensory changes in the body denote involvement of the lateral spinothalamic tract in the left medulla. In regard to the hyperactive reflexes in the right arm, pyramidal tract involvement is not common, but occasionally occurs. Terminal development of an episode of complete flaccidity implies sudden extension of the pathologic process and perhaps also represents the diaschisis of Monakow. Thus, our patient developed an extensive lesion in the left side of the brain stem. Nuclei involved were the 5th (spinal), 7th, 8th (Deiters'), 9th, 10th, 11th (nucleus ambiguus), and the 12th (hypoglossal). Tracts involved were cerebellar, lateral spinothalamic, and pyramidal, plus the sympathetics.

DISCUSSION

The prognosis in this syndrome is considered fairly good, and early deaths are not the rule. In the series of 28 cases of Lewis, Littman, and Foley,[6] however, half of the 20 patients who were followed died. Seven died during the initial hospitalization (even though hospitalization was prolonged to eight months in 1 case), and 3 died after discharge; 5 of the 10 patients who died were considered to have had recurrent strokes. A case such as the one outlined above, however, based on hemorrhage, would probably be fatal in any instance.

As a causative factor in this case the hypertension of nine years' duration must be blamed, even though its course and

intensity are not known. Why such a vessel as the posterior inferior cerebellar artery should happen to be the locale for a cerebral hemorrhage is difficult to understand. Although a congenital aneurysm of the vessel would help to explain the strange localization, no evidence of a vessel wall could be seen in microscopic sections. Thus, this must remain an instance of primary cerebral hemorrhage.

SUMMARY

A case is presented of a 34-year-old man who one night had an acute onset of severe left occipital pain. Vertigo, difficulty in swallowing, and a staggering gait with falling to the left soon followed. His symptoms continued, and a diagnosis of bulbar poliomyelitis was considered. Past history revealed a chronic hypertension of 9 years' duration. On admission to this hospital, neurological examination was compatible with Wallenberg's syndrome. On the day before death the spinal fluid was found to be bloody, whereas a previous spinal tap had been normal. Death ensued just six days after the onset of illness.

At autopsy the main finding was in the brain stem. A bulging hemorrhage was noted in the left side of the medulla oblongata. This hemorrhage was quite extensive, sparing only a portion of the inferior olive, and diffusing into the opposite half of the medulla.

This is considered to be an instance of Wallenberg's syndrome as the result of hemorrhage in the medulla oblongata, superimposed on a background of chronic hypertensive disease in a relatively young adult male.

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Coexisting Ovalocytosis and Hemoglobin C Trait

EDWARD S. MONGAN, *Captain, MC, USA*

OVALOCYTOSIS is an abnormality of erythrocyte morphology in which the cells are oval or elliptic. It is a hereditary trait transmitted by either sex as a Mendelian dominant.[1] Although its exact incidence is unknown, it is relatively uncommon. There are no known racial or sexual predispositions. Usually ovalocytosis does not produce ill health or anemia, but in about 12 per cent of the cases mild hemolytic phenomena can be found.[2]

Hemoglobin C was first described in 1950 by Itano and Neel.[3] It is an inherited abnormality of human hemoglobin detected by electrophoretic studies. The trait is usually asymptomatic, yet hemolysis and mild clinical symptoms can be found in patients with homozygous hemoglobin C. Cases of hemoglobin C trait have been described in association with other abnormal hemoglobins, notably with hemoglobin S.[4]

In 1956 Avery[5] reported two children who had ovalocytosis and hemoglobin C trait. In her cases the two hereditary abnormalities did not produce a summation of effect for neither child had any evidence of an increased hemolytic process. The following is a case report of another patient with coexisting ovalocytosis and hemoglobin C trait.

CASE REPORT

The patient, a 25-year-old Negro, was first admitted to this hospital on 24 January 1957 with a chief complaint of a cough of one-week duration. The cough was productive of one-half cupful of whitish sputum daily. About six months before his admission he noted the onset of nervousness, sweating, decreased heat tolerance, and a weight loss of about 10 pounds, despite a good appetite. On the day of admission he developed chills, fever, and right-sided chest pain.

There was no family history of tuberculosis, diabetes, allergy, anemia, or of any hematologic disorder. Both parents, four brothers, and two sisters were alive and healthy.

From William Beaumont Army Hospital, El Paso, Tex. Dr. Mongan is now at The University of Rochester Medical Center, 260 Crittenden Boulevard, Rochester, N. Y.

Physical examination revealed an acutely ill, well-developed man. His blood pressure was 140/70 mm Hg; pulse rate, 120 beats per minute; temperature, 104.2°F; and his respiratory rate was 32 per minute. His skin was hot, moist, and rather fine. There was bilateral exophthalmos, but no diplopia. The thyroid was diffusely enlarged—about three times the normal size. There were decreased breath sounds and a few moist rales at both bases posteriorly. The remainder of the physical examination was within normal limits.

Laboratory data on admission included a white blood cell count of 24,100 per μl with 89 per cent neutrophils, 8 per cent lymphocytes, and 3 per cent monocytes. Hemoglobin was 14.7 grams per 100 ml and the hematocrit was 42 ml per 100 ml. Urinalysis, serologic tests for syphilis, throat culture, and three sputum cultures for bacterial pathogens, fungi, and tuberculosis were normal. A tuberculin skin test using second strength PPD was positive; histoplasmin and coccidioidin skin tests with a dilution of 1:100 were negative. A roentgenogram of the chest revealed a bilateral basilar pneumonitis. Total serum cholesterol was 120 mg per 100 ml, protein-bound iodine was 17.9 μg per 100 ml, and basal metabolic rates after the pneumonitis had cleared were plus 32 and plus 39 per cent. By the second hospital week the white blood cell count was 5,500 per μl with 60 per cent lymphocytes. The lymphocytosis persisted for the rest of the hospitalization. On all blood smears, there was from 40 to 60 per cent ovalocytosis and some anisocytosis (fig. 1). The red blood cells on occasion appeared hypochromic. Paper electrophoretic studies of the patient's hemoglobin revealed "CA" hemoglobin. A sickle-cell preparation was negative. The patient's hemoglobin and hematocrit were within normal limits at all times.

The pneumonitis responded promptly on bed rest and penicillin therapy. A repeat roentgenogram on 31 January showed resolution of the pneumonia. After the diagnosis of hyperthyroidism was established, the patient was started on Tapazole (brand of methimazole) on 12 February. By 25 April his basal metabolic rate was normal and he clinically appeared euthyroid. He was then started on Lugol's solution without any noticeable diminution in the size of the thyroid gland. On 16 May a subtotal thyroidectomy was performed, which the patient tolerated well. His postoperative course was uneventful, and except for the exophthalmos which persisted, he remained euthyroid. He was returned to duty on 25 May, and arrangements were made to follow him in the ophthalmology clinic.

The patient was readmitted to this hospital on 26 August with a 10-day history of cough. For a week prior to admission he had noted night sweats, chills, nausea, and anorexia. On the day of admission he developed some right anterior chest pain which was made worse by inspiration. In the month prior to admission he had lost 16 pounds.

Physical examination revealed an acutely ill, young man. His temperature was 101°F; pulse, 96 beats per minute; respirations, 26 per minute; and his blood pressure was 120/62 mm Hg. There was marked

exophthalmos and the patient complained of diplopia on extreme lateral gaze to the right. Examination of the chest revealed minimal splinting on the right with a few rales at the right base anteriorly, but no decrease in breath sounds and no dullness to percussion. There was a well-healed thyroidectomy scar. The remainder of the physical examination was within normal limits and there was nothing to suggest reactivation of the hyperthyroidism.

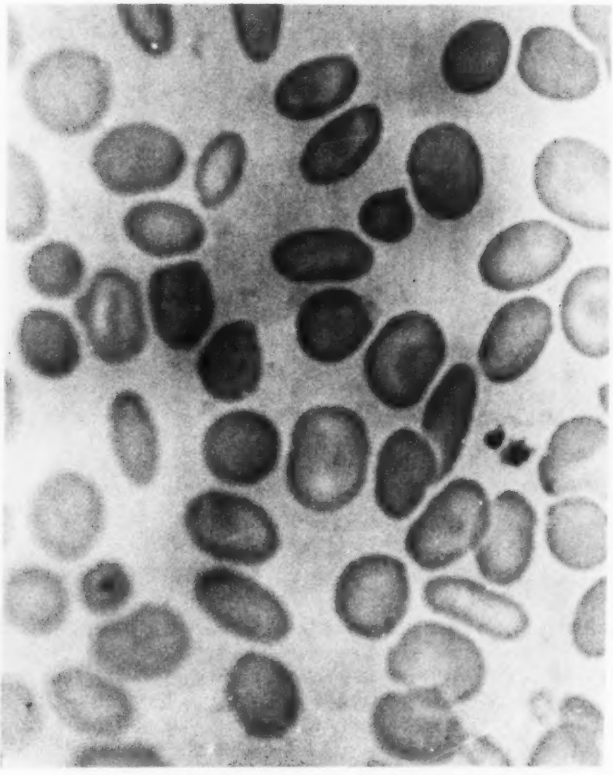

Figure 1. Peripheral blood smear. (Wright's stain, × 350)

Laboratory data showed a white blood cell count of 12,500 per μl with 83 per cent neutrophils, 16 per cent lymphocytes, and 1 per cent monocytes. Hemoglobin was 14.0 grams per 100 ml. The hematocrit was 42 ml per 100 ml, and the red blood cell count was 5,250,000 per μl. On this admission, anisocytosis and from 40 to 60 per cent ovalocytosis were noted on all blood smears. "CA" hemoglobin was again noted on electrophoretic studies (fig. 2). The reticulocyte count was 0.5 per cent, the mean corpuscular volume was 88 cu μ, the mean corpuscular hemoglobin was 30 $\mu\mu$g, and the mean corpuscular hemoglobin con-

centration was 34 per cent. Red blood cell fragility showed an initial hemolysis in both the control and in the patient at a concentration of 0.48 per cent NaCl, with complete hemolysis at 0.32 per cent in the control and 0.28 per cent in the patient. The direct bilirubin was 0.16

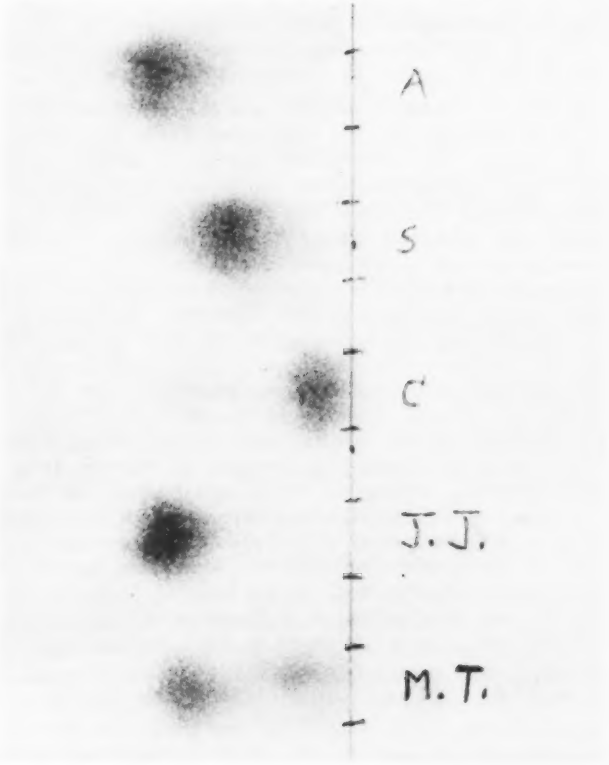

Figure 2. Photograph of the filter paper on which the electrophoretic studies were made. "A" represents normal adult hemoglobin; "S" represents homozygous sickle hemoglobin; "C" represents homozygous C hemoglobin; "JJ" represents normal adult hemoglobin in a patient with ovalocytosis; and "MT" represents the hemoglobin of the patient in this report. Note that he has "CA" hemoglobin.

mg per 100 ml and the indirect bilirubin was 0.52 mg per 100 ml. The urine urobilinogen was 0.25 Ehrlich units per two hours. The serum cholesterol was 195 mg per 100 ml, the protein-bound iodine was 7.9 and 6.4 μg per 100 ml, and the basal metabolic rate was minus 16 and minus 4 per cent. Blood culture and serologic tests for syphilis were negative on admission. Six gastric washings were negative by culture for fungi and tuberculosis. Tuberculin and coccidioidin skin tests were

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positive; the histoplasmin skin test remained negative. The white blood cell count returned to normal two weeks after admission and remained so. There was never an eosinophilia. The patient was not anemic throughout his second hospitalization. The admission roentgenogram of the chest showed a pneumonitis at the right base and some right hilar adenopathy. These roentgenographic findings did not clear completely until November. The electrocardiographic findings were within normal limits.

The patient was placed on bed rest and penicillin, but his symptoms did not clear promptly and his right-sided chest pain persisted. On the sixth hospital day tetracycline was given without benefit. The antibiotics were discontinued after two weeks. A tentative diagnosis of pulmonary coccidioidomycosis was made on the basis of the clinical picture, the hilar adenopathy, the lack of response to antibiotics, and the conversion of the coccidioidin test between January and August 1957. The patient continued to run a low-grade fever for the first month of hospitalization, but was afebrile thereafter. Complement fixation titer for coccidioidomycosis was positive 1:4 on 11 September and by 2 December was positive to a dilution of 1:128. On this basis, dissemination of the fungus infection was postulated although the patient at no time had any clinical evidence of dissemination. The patient was treated supportively in the hospital until the complement fixation titer for coccidioidomycosis started to decrease, in January 1958, to 1:64 and then stabilized. Throughout his hospitalization the patient was closely followed in the ophthalmology department for his exophthalmos. He was given a month's trial of Serpasil (brand of reserpine) without any effect on the exophthalmos. He was started on thyroid extract to toleration for the same reason. At the time of discharge he was on 390 mg of thyroid daily without much improvement. He returned to duty on 27 March and is being followed in the ophthalmology and chest clinics.

COMMENTS

The presence of over 40 per cent ovalocytosis on all the blood smears completed on this patient during his two hospitalizations established the diagnosis of ovalocytosis. The electrophoretic studies of the hemoglobin on two occasions confirmed the diagnosis of hemoglobin C trait. There was no clinical or laboratory evidence of increased red blood cell destruction in this patient. Unfortunately, it was impossible to study his family. Despite the presence of a bilateral pneumonia, thyrotoxicosis, and disseminated coccidioidomycosis in a 14-month period, the erythrocyte abnormalities in this patient at no time were clinically evident. His recovery from all three illnesses occurred as promptly as could be expected. This finding is in keeping with the conclusion of Avery that these two abnormalities do not produce a summation of effect. Since increased hemolysis does occasionally occur in either of these two conditions in the heterozygous state, one would expect a small percentage of patients with both

abnormalities to show some evidence of increased erythrocyte destruction. If one of the conditions were homozygous, moreover, increased hemolysis would then probably be expected.

SUMMARY

A case of coexisting ovalocytosis and hemoglobin C trait is reported. There was no laboratory or clinical evidence of increased red blood cell destruction. These two abnormalities evidently can be associated without a summation of effect.

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HOW TO USE A PLACEBO

"The question of whether a placebo is a physical or a psychologic form of treatment has caused much confusion. The answer seems to be that it is a psychologic form of treatment employing a physical substance. The moral problem of honesty that has clouded the issue and has often resulted in hedging and self-deception on the physician's part could be avoided if a psychologic frame of reference were explicitly acknowledged and used. This requires, however, that the physician be able to view psychotherapy as a legitimate and effective therapeutic measure. The selection of patients for treatment with a placebo should be based on the usual criteria for the selection of one or another psychologic technic. Since the placebo aims at the eradication of symptoms, it should not be employed when an etiologically-oriented therapeutic approach is feasible."

—MARC H. HOLLENDER, M. D.
in *American Practitioner Digest of Treatment*
p. 217, Feb. 1958

Departments

GEN. HARRY G. ARMSTRONG, LEADER IN AVIATION AND SPACE MEDICINE, RETIRES

Major General Harry G. Armstrong, USAF (MC), a pioneer in aviation and space medicine and former Surgeon General of the United States Air Force, retired on 1 September after almost 30 years military service.

General Armstrong

A rare combination of research scientist, physician, and military administrator, Gen. Armstrong was the first to conduct many experiments which provided the medical knowledge to enable man to fly at the great altitudes and high speeds of today's aircraft. On 9 February 1949, while he was Commandant of the U. S. Air Force School of Aviation Medicine, he established the Department of Space Medicine—the first laboratory of its kind. He is the author of *Principles and Practice of Aviation Medicine* which is in wide use throughout the world as the standard textbook in this specialty. He is also the author of more than 75 scientific papers on aviation and space medicine.

In 1934, Major General Malcolm C. Grow and General Armstrong cofounded the Aero Medical Laboratory at Wright-Patterson Air Force Base, Ohio, and General Armstrong was selected as the first Director.

In 1936, General Armstrong won the Wellcome Award of the Association of Military Surgeons and in 1940, he was a co-recipient of the Collier Trophy, given annually for the greatest contribution to aviation. In 1941 he received the John Jeffries Award from the Institute of Aeronautical Sciences. The Aero Medical Association in 1949 honored him with the Theodore C. Lyster Award for eminence in aviation medicine.

General Armstrong served as president of the Aero Medical Association and the Association of Military Surgeons in 1952—the first person to head both of these societies simultaneously. For the past three years General Armstrong has been serving as Surgeon of the United States Air Forces in Europe. During this period, he organized a Central Aero Medical Group which renders special operational aeromedical support to the USAFE Command and to NATO nations. He was active in promoting international conferences with European countries, in the French Branch of the Aero Medical Association, and in fostering development of an all-European Branch of the Aero Medical Association. In 1956, he organized the first German-American Joint Aviation Medicine Symposium where outstanding scientists in aeromedical research exchanged information.

FOUR NAVAL MEDICAL AND DENTAL OFFICERS SELECTED FOR PROMOTION TO REAR ADMIRAL

Capt. Chrisman

Capt. Galloway

Capt. Kreuz

Capt. Schantz

Four captains of the Medical Department of the Navy, Allan S. Chrisman, Calvin B. Galloway, Frank P. Kreuz, Jr., Medical Corps, and Curtiss W. Schantz, Dental Corps, were recently selected for promotion to Rear Admiral. Captain Chrisman, is the Commanding Officer, U. S. Naval Hospital, San Diego, Calif. Captains Kreuz, Galloway, and Schantz are at the National Naval Medical Center, Bethesda, Md., commanding the U. S. Naval Hospital, U. S. Naval Medical School, and U. S. Naval Dental School, respectively.

A. M. A. SECTION ON MILITARY MEDICINE ELECTS DR. ALPHONSE McMAHON CHAIRMAN

Alphonse McMahon, M. D., Associate Professor of Medicine, St. Louis University School of Medicine, and Rear Admiral, MC, USNR (Ret.) was elected Chairman of the Section of Military Medicine of the American Medical Association at the annual meeting in San Francisco in June. George H. Houck, M. D., Palo Alto, Calif., was chosen Vice Chairman. Other officers included Colonel Charles H. Bramlitt, USAF (MC), Washington, D. C., Charles L. Leedham, M. D., Cleveland, Ohio, who were elected Secretary and Delegate, respectively. Captain Robert V. Schultz, MC, USN, Washington, D. C., was named Representative to the Scientific Exhibit.

Dr. McMahon

GEN. PAUL ROBINSON RETIRES, SUCCEEDED AS MEDICARE CHIEF BY COL. WERGELAND

Major General Paul I. Robinson, MC, USA, Executive Director of the Dependents' Medical Care Program since its inception in December 1956, will become coordinator of medical relations for the Metropolitan Life Insurance Company when he retires 31 August, after more than 30 years' active service. General Robinson will be succeeded by Colonel Floyd L. Wergeland, MC, USA, now Assistant to the Executive Director.

Gen. Robinson

Gen. Schwichtenberg

Gen. Seeley

Gen. Mattingly

Three other senior medical officers whose retirements have been announced are Brigadier General Albert Schwichtenberg, USAF (MC), formerly Surgeon of the Air Defense Command; Brigadier General Sam F. Seeley, MC, USA, Chief of the Professional Division in the Office of the Army Surgeon General, Washington, D. C.; and Brigadier General Thomas W. Mattingly, MC, USA, Chief of the Department of Medicine, Walter Reed Army Hospital. General Schwichtenberg has been appointed Head of the Department of Aviation and Space Medicine of the Lovelace Foundation, Albuquerque, New Mexico. General Mattingly, who has served as one of the President's physicians, will become Director of Medical Education at the Washington Health Center, Washington, D. C. On 1 September, General Seeley will become a Professional Associate of the National Research Council in Washington, D. C.

Official Decorations

The following awards were recently announced by the Department of the Air Force.

Legion of Merit

Jack Bollerud, Col., USAF (MC)

Albert H. Schwichtenberg, Brig. Gen., USAF (MC)

Air Force Commendation Medal

Geoffrey P. Wiedeman, Col., USAF (MC)

Cardis W. Bryan, Lt. Col., USAF (MSC)

OFFICERS CERTIFIED BY SPECIALTY BOARDS

Supplementary Listing

The Surgeons General of the military medical services have announced that the following regular Medical and Dental Corps officers have been certified by the boards indicated since the listings published in previous issues of the *Journal.*

American Board of Pediatrics

Thomas A. Hanson, Capt., USA
Edward C. McKeon, Capt., USA

American Board of Radiology

Paul E. Siebert, Capt., USA

American Board of Obstetrics and Gynecology

Robert L. Baker, Lt. Comdr., USN
Robert K. Barton, Lt. Comdr., USN
David C. Beer, Lt. Comdr., USN
Winton R. Boyd, Comdr., USN
George A. Brennan, Lt. Comdr., USN
Charles E. Gibbs, Maj., USAF
Ernest F. Latham, Lt. Comdr., USN
Walter M. Lonergan, Lt. Comdr., USN
Kenneth N. Morese, Maj., USAF
Donald J. Summerson, Lt. Col., USA
George J. Taylor, Comdr., USN
Wilson D. Tucker, Capt., USN

American Board of Internal Medicine

Joseph T. Horgan, Lt., USN
Willis S. Myers, Lt. Comdr., USN
Henry A. Sparks, Lt. Comdr., USN
James C. Syner, Maj., USA
Harry A. Weiss, Capt., USN

American Board of Pathology

Pathologic Anatomy and Clinical Pathology

Richard B. Krakaur, Maj., USA
Peter B. Macomber, Capt., USA
Harry F. Sproat, Lt. Col., USA

American Board of Surgery

Norman J. Cole, Maj., USA
Joseph L. Hannon, Maj., USA
William T. Lineberry, Jr., Comdr., USN
Harold P. Pariser, Comdr., USN
Walter E. Switzer, Maj., USA
Max J. Trummer, Lt. Comdr., USN

American Board of Physical Medicine and Rehabilitation

Robert A. Gregg, Maj., USA

American Board of Preventive Medicine

Public Health

Henry J. Donnelly, Maj., USA
Jerome H. Greenberg, Capt., USA
Charles W. Kraul, Lt. Col., USA

Aviation Medicine

Claud M. Mears, Col., USAF
John A. Norton, Col., USAF
Philip P. Pease, Col., USAF
Robert K. Quinnell, Lt. Col., USAF
Christopher C. Shaw, Capt., USN
Alfred R. Stumpe, Jr., Maj., USAF
Charles A. Veatch, Lt. Col., USAF

Occupational Medicine

Hilliard D. Estes, Capt., USAF Charles W. Kraul, Lt. Col., USA

American Board of Oral Surgery

Kimble A. Traeger, Comdr., USN

COL. BERNIER NAMED "OUTSTANDING DENTIST"

Colonel Joseph L. Bernier, DC, USA, has been included among the "Twelve outstanding dentists," of the United States in a permanent photographic exhibit in the University of Haiti Dental School, Port-au-Prince, Haiti. The selection, made by the National Library of Medicine, cites Colonel Bernier for his "outstanding contribution to and development of the specialty of oral pathology." His present duty assignment is Chief of the Dental and Oral Pathology Section of the Armed Forces Institute of Pathology.

Colonel Bernier

In addition to Colonel Bernier, the group includes: John Greenwood (1760-1819), Horace H. Hayden (1769-1844), Solyman Brown (1790-1876), Eleazar Parmly (1797-1874), Chapin Aaron Harris (1806-1860), Horace Wells (1815-1848), Greene Vardiman Black (1836-1915), Henry Trendley Dean (1893-), Kenneth A. Easlick (1893-), William J. Gies (1872-1956), and J. Ben Robinson (1883-).

SYMPOSIUMS ON MEDICAL ASPECTS OF ATOMIC WEAPONS

Armed Forces Special Weapons Project Medical Symposiums are scheduled to be conducted at Sandia Base, New Mexico, on 6-10 October 1958; 3-7 November 1958; and 16-20 March 1959. These symposiums are designed to orient medical personnel in the problems of accidents involving nuclear weapons, the industrial and toxicological hazard of modern nuclear weapons, and related subjects.

Applications to attend these courses should be submitted to the Surgeons General, U. S. Army or U. S. Air Force, or to Chief, Bureau of Medicine and Surgery, U. S. Navy, through channels.

A MESSAGE FROM THE A. M. A.

A Report on the Medical Use of Hypnosis, submitted by the American Medical Association's Council on Mental Health, was approved by the House of Delegates of the Association at the 107th Annual Meeting of the Association in San Francisco in June 1958. The experiences of World War II having contributed to a reawakened interest in hypnosis, a summary of the Report may be of interest to physicians serving in the military forces.

The work of the Council on Mental Health was limited to the specific theme of the medical use of hypnosis in its therapeutic aspects, because this seemed to be the most relevant area for consideration.

There was unanimous agreement that there was no need at this time to question the validity of the various phenomena elicited by hypnotic technics. Actually, in the literature on hypnosis practically all of these phenomena have been noted in one way or another since the time of Mesmer. In spite of this, however, it is still difficult to arrive at a formulation of hypnosis that is completely satisfactory. The Subcommittee of the British Medical Association presented the following definition, with which there was agreement in general:

> A temporary condition of altered attention in the subject which may be induced by another person and in which a variety of phenomena may appear spontaneously or in response to verbal or other stimuli. These phenomena include alterations in consciousness and memory, increased susceptibility to suggestion, and the production in the subject of responses and ideas unfamiliar to him in his usual state of mind. Further, phenomena such as anesthesia, paralysis, and the rigidity of muscles, and vasomotor changes can be produced and removed in the hypnotic state.

The Council emphasized certain regressive aspects of hypnosis. It also stressed the fact that hypnotic phenomena were of a wide variety and should not be limited only to the so-called trance state.

In order to begin to understand these phenomena, it is necessary to place hypnosis within the general framework of psychodynamic psychology and psychiatry. This has implications not only for the theoretical understanding of hypnosis, but also for its therapeutic application and will therefore be related in an important way to any teaching and training program. In a sense, it is unfortunate that the induction of hypnosis is generally so simple a matter that it requires little or no technical skill or training. This, in itself, represents one of the main hazards in

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —*Editor*

its utilization, since it lends itself to over-simplification and over-dramatization with a production of spectacular phenomena that are meat for the charlatan. The use of hypnosis has a recognized place in the medical armamentarium and is a useful technic in the treatment of certain illnesses when employed by qualified medical and dental personnel.

It has already been emphasized that a background of psychodynamic psychology and psychiatry is essential in order to understand the phenomena of hypnosis. It is equally important to insist on the fact that the utilization of hypnotic technics for therapeutic purposes should be restricted to those individuals who are qualified by background and training to fulfill all the necessary criteria that are required for a complete diagnosis of the illness which is to be treated. Hypnosis should be used on a highly selective basis by such individuals and should never become a single technic used under all circumstances by a therapist. No physician or dentist should utilize hypnosis for purposes that are not related to his particular specialty and that are beyond the range of his ordinary competence. As an example, a trained and qualified dentist might use hypnosis for hypnoanesthesia, hypnoanalgesia, or for the allaying of anxiety in relation to specific dental work. Under no circumstances would it be proper for him to use hypnosis for the treatment of neurotic difficulties of his patient. The surgeon, obstetrician, anesthesiologist, gynecologist, internist, and general practitioner may legitimately utilize these technics within the framework of their own particular field of competence.

It can be stated, therefore, that:

1. General practitioners, medical specialists, and dentists might find hypnosis valuable as a therapeutic adjunct within the specific field of their professional competence. It should be stressed that all those who use hypnosis need to be aware of the complex nature of the phenomena involved.

2. Teaching related to hypnosis should be under responsible medical or dental direction, and integrated teaching programs should include not only the technics of induction but also the indications and limitations for its use within the specific area involved. Instruction limited to induction technics alone should be discouraged.

3. Certain aspects of hypnosis still remain unknown and controversial, as is true in many other areas of medicine and the psychologic sciences. Therefore, active participation in high level research by members of the medical and dental professions is to be encouraged.

4. The use of hypnosis for entertainment purposes is vigorously condemned.

CORRESPONDENCE

Presidential Physicians

To the Editor:—With respect to your editorial "White House Doctors" in the April issue of the *Journal* I should like to point out some errors of omission and commission in the article quoted from *MD.*

Dr. Samuel Bard and not Dr. Craik treated Washington for the carbuncle. The story is told in J. B. Langstaff's *Doctor Bard of Hyde Park...* The Man Who Saved Washington's Life (New York, Dutton, 1942). The place was New York City, the date June 1789. Again it was Dr. John Jones who treated Washington for a severe attack of pneumonia. This was in New York City, May-June 1790 and the account may be found in James Thacher's *American Medical Biography* (Boston, 1828).

Dr. Physick was never "appointed" physician to President Jackson. Dr. Physick merely examined President Jackson once in Philadelphia in 1833.

Lt. Col. Basil Norris attended officially President Grant during the latter's terms in the White House. (1869-1877). Fordyce Barker was, of course, in charge during Grant's last illness (1885).

CHARLES ROOS
National Library of Medicine
Washington, D. C.

The *Journal* welcomes an opportunity to correct the record. Reprinted in part from the *Medical Annals of the District of Columbia* for February 1958, the interesting editorial about presidential physicians was based on an article in the first number of *MD,* February 1957.—*Editor.*

DEATHS

BLODGETT, George Francis, Captain, MC, USN, of Little Rock, Ark.; assigned to U. S. Naval Station, New Orleans, La.; graduated in 1930 from the University of Arkansas School of Medicine, Little Rock, Ark.; appointed a lieutenant, junior grade, in the United States Navy 30 June 1930; died 9 July 1958, age 56, at the U. S. Naval Station, New Orleans, of myocardial infarction.

LOVE, Jack Preston, Lieutenant Colonel, MSC, USA, of San Antonio, Tex.; assigned to the Office of the Surgeon General, Department of the Army, Washington, D. C.; graduated in 1947 from Northwestern University, Chicago, Ill., served in an enlisted status from 6 February 1941 until 23 December 1941; commissioned a second lieutenant in the Army of the United States 24 December 1941; appointed a first lieutenant in the United States Army 5 July 1946; died 16 July 1958, age 41, in Washington, of injuries incurred in a fall.

Reviews of Recent Books

PROGRESS IN ARTHRITIS, edited by *John H. Talbott,* M. D., and *L. Maxwell Lockie,* M. D. 456 pages; illustrated. Grune and Stratton, Inc., New York, N. Y., 1958. Price $12.50.

This is a convenient, easy-to-read, 456-page volume, edited by well-recognized authors, and contributed to by a large number of other physicians, many of whom are eminent in rheumatology. There are 64 pages covering the many facets of rheumatoid arthritis. The other clinical entities in rheumatology are adequately discussed, and illustrated, and references are listed at the end of each chapter. Therapy is discussed in an analytical manner, incorporating current pharmacological thinking. A very practical but short chapter on rehabilitation is timely and practical.

This volume will be found worthwhile to the internist, rheumatologist, teacher, and student. —*FRANCIS W. PRUITT, Col., MC, USA*

PATHOLOGY FOR THE PHYSICIAN, by *William Boyd,* M. D., Dipl. Psychiat., M. R. C. P. (Edin.), Hon. F. R. C. P. (Edin.), F. R. C. P. (Lond.), F. R. C. S. (Can.), F. R. S. (Can.), LL. D. (Sask.), (Queen's) D. Sc. (Man.), M. D. (Oslo). 6th edition, thoroughly revised. 900 pages; 489 illustrations and 12 plates in color. Lea & Febiger, Philadelphia, Pa., 1958. Price $17.50.

This sixth edition is a complete revision of Dr. Boyd's universally popular text of the pathology of internal diseases. The contents are arranged so as to cover the various anatomic systems in 19 separate chapters, and a final one on our internal environment. This latter includes consideration of the physiology and pathology of water, electrolytes, and acid-base balances. The value of the book is enhanced by the easy-to-read writing style of the author. The various pathologic changes are enlivened by their correlation with the clinical signs and symptoms that they produce. The chapters devoted to the endocrine system are as up-to-date as is possible in a textbook, and present the complex subject of endocrine pathology in a clear and understanding fashion. The chapter on the respiratory system contains an extremely interesting discourse of the relationship of smoking to carcinoma of the lung and typifies the excellent editorial style of this book. As the author states in the preface, this text has been prepared "with the graduate rather than the undergraduate student in mind, the physician or internist rather than the pathologist, the young rather than the old." This book is a must in every physician's library.

—*FRANK M. TOWNSEND, Col., USAF (MC)*

ESSENTIALS OF GYNECOLOGY, by *E. Stewart Taylor,* M. D. 502 pages; 343 illustrations, 4 in color. Lea & Febiger, Philadelphia, Pa., 1958. Price $12.

This book, fortunately, lives up to its title. It is concise, up to date, well organized, and well written. The subject matter is adequately covered without verbosity and yet with enough detail to make it intelligible. The book is profusely and pertinently illustrated.

The author has eliminated all controversial and archaic material and has set down a clear exposition of the subject as he sees it. Surgical indications and technics are apparently those which he uses and approves. The book has evidently grown out of lecture material and as such is ideally suited for a text which can be amplified by lectures and discussions. It is also a ready reference.

The paper, typography, and binding are excellent. The index and bibliography are adequate.—*ROY E. CROWDER, Capt., MC, USN*

THE ACUTE ABDOMEN, by *William Requarth,* M. D. Foreword by *Warren H. Cole,* M. D. 2d edition. 313 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $6.50.

This compact volume deals with the acute abdomen from the viewpoint of differential diagnosis. It stresses the importance of emergency surgery in certain conditions, even though a definitive diagnosis is in doubt; and of equal importance, the contraindication of emergency surgery in other acute abdominal conditions. Arachnidism, periarteritis nodosa, and pancreatitis are among the medical conditions for which the author considers operation contraindicated or harmful.

There is room for controversy concerning diseases for which operation can be delayed, and it is to the credit of the author that he mentions the differences of opinion. An example of this is the discussion on the treatment of acute cholecystitis. Chapter 3, "Acute Intestinal Obstruction," has much worthwhile material in it, and is probably the best chapter in the book.

The references listed at the end of each chapter are adequate to guide the reader to additional literature. This book is recommended for interns and residents in general surgery.

—*PHILIP J. McNAMARA, Capt., MC, USN*

AUSCULTATION OF THE HEART, by *Abe Ravin,* M. D. 166 pages: illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $6.

A short but clearly and precisely written treatise on auscultation of the heart. This text should be extremely useful to the medical student as well as to the practicing physician who desires to get the most out of clinical examination of his patient. The author gives adequate importance to the study and evaluation of the heart sounds as well as murmurs. The descriptive material is adequately supported by sound tracings and by a uniform graphic system of recording auscultatory findings which make it easy for the reader to follow the text. A selected bibliography and index is provided.

—*THOMAS W. MATTINGLY, Brig. Gen., MC, USA*

CLINICAL ENZYMOLOGY, edited by *Gustav J. Martin,* Sc. D. 241 pages; illustrated. Little, Brown and Company, Boston, Mass., 1958. Price $6.

This book is interesting to read not so much for the clinical applications, which are limited, but because it affords a glance at the vast

complexities of biological processes of which the enzymes are an essential part.

Early clinical trials of enzymes were equivocal because of the difficulties of purification. Trypsin has had the most use and always seems to promise more than it actually gives. Streptokinase and hyaluronidase are still useful. Cholinesterase has many interesting facets but little clinical use. Parenteral use of enzymes is discussed. The small doses used are explained by the nature of enzyme action as a catalyst. Examples of trypsin's effectiveness in treating acute thrombophlebitis are given. The basic action seems to be an anti-inflammatory effect. Interesting but inconstant effects have been noted in cancer, in which at times there was arrest or shrinkage of the growth, relief of pain. The best results, with little side reaction, are obtained when trypsin is administered intramuscularly. Even then care must be taken to avoid getting the enzyme in the subcutaneous tissues. The chief complication is usually pain and induration at site of injection. In the diagnostic use of enzymes, amylase determination is useful in acute pancreatitis, less so in chronic pancreatitis. Transaminase is of help in myocardial infarction. No mention is made of its use in infectious hepatitis.—*JAMES L. TOBIN, COL, USAF (MC)*

ATRIAL ARRHYTHMIAS, DIGITALIS AND POTASSIUM, by *Bernard Lown*, M. D., and *Harold D. Levine*, M. D. 222 pages; illustrated. Landsberger Medical Books, Inc., New York, N. Y., 1958. Price $6.90.

The authors present the thesis that atrial disorders during digitalis medication are frequent and are becoming more common in recent years. The material presented is based on both prolonged clinical studies plus animal experiments. The whole book is devoted to a delineation of experimental and clinical evaluation.

The authors point out that nearly every form of disordered heart beat may result from digitalis toxicity. They noted that individuals with a normal heart can tolerate large doses of digitalis but that with increasing failure the ratio between therapeutic and toxic dose narrows. It is emphasized that the lowering of body potassium concentration is an important factor in digitalis toxicity. Such hypokaliemia occurs readily during modern therapy for cardiac decompensation. Much emphasis is placed on the importance of body electrolyte changes during heart failure and therapy therefor. The authors include numerous studies made on patients during hemodialysis both with and without associated digitalis therapy. Clinical studies are presented in detail, including case summaries and individual comment on each case.

The book dwells at length on the electrocardiographic diagnosis of cardiac arrhythmias. There also is a chapter on the therapy of digitalis toxicity, and 43 pages are allocated to speculation and hypothesis as to the action of digitalis in producing cardiac arrhythmias.

This book is written in excellent style and readily attracts and holds the interest of the reader. Opinions are stated conservatively and with supportive data. The bibliography was well selected and

includes 198 references. Numerous, clearly reproduced electrocardiograms illustrate the clinical and experimental data. The material is well presented from a scientific standpoint and accomplishes the stated purpose of the author. The book is principally of interest to students of internal medicine, cardiology, pediatrics, and physiology.

—BYRON A. NICHOL, Col., MC, USA

PEDIATRIC CLINICS OF NORTH AMERICA, May 1958, Symposium on recent clinical advances: *Alan Ross*, M. D., Consulting Editor. 558 pages; illustrated. W. B. Saunders Company, Philadelphia, Pa., 1958. Price $15 per year of four books issued quarterly (February, May, August, November). Sold only on a yearly basis.

This issue of the Pediatric Clinics of North America proves that the editors have used the title in its truest sense, because the entire issue is devoted to a symposium on recent clinical advances from Canadian authors. The caliber and scope of the articles further show that the level of Canadian pediatric practice is of the highest order.

Nineteen articles in this issue cover a wide field of pediatric practice, and a few are encyclopedic, while others highlight the more recent developments. The reader interested in the care of children will find most of the papers in this symposium of distinct practical value.

Of special interest to the practicing pediatrician are the chapters describing the newer laboratory procedures and their application to the investigation of pediatric disorders, the diagnosis and management of sex anomalies, and the diagnosis and management of the various types of rickets.

Several articles dealing with subjects currently much discussed in the lay press are included. These include an excellent guide to genetic counselling in some pediatric diseases, and two helpful chapters to aid the physician in his role of adviser when asked about reading disabilities and adoption.—*THOMAS E. CONE, Jr., Capt., MC, USN*

ON THE UTILITY OF MEDICAL HISTORY, Monograph I, Institute on Social and Historical Medicine, The New York Academy of Medicine. *Iago Galdston*, M. D., editor. 73 pages. International Universities Press, Inc., New York, N. Y., 1957. Price $2.

Organized to enquire whether medical history can serve to illuminate current problems and issues in medicine, the Institute on Social and Historical Medicine has now published the first of a series of monographs devoted to its proceedings. The present volume contains six interesting and highly readable papers which explore the topic "On the utility of medical history." The central concern is for the future of medicine.

The authors are eminent in either the field of medical history or in related areas. Dr. Iago Galdston of the New York Academy of Medicine, editor of the volume, introduces the topic theme with the statement that the "traditional order (in medicine) has failed." Dr. Galdston concludes that the medical historian has the obligation to illuminate

the origin of this predicament so that we may be better able to anticipate the future; and that in this illumination "lies the attestation of the utility of medical history."

In the paper "Purposes and Values of Medical History," Dr. George Rosen of the Columbia University School of Public Health notes that even though modern man lives in a scientific age, he is nevertheless "incorrigibly historical in his outlook." Dr. Owsei Temkin of the Johns Hopkins University, in "A Critique of Medical Historiography", takes historiography to task with these words: "I do not care whether you write as historians or doctors, but see to it that what you write is good, for I want to profit by my reading." Dr. Gregory Zilboorg, also of the New York Academy of Medicine, concludes that there "is no such thing as objective history or objective historiography;" that events are always interpreted in terms of the times; and that in the serious world crisis of today it is more important than ever to teach the history of medicine so as to place current events into historical perspective. Dr. Edwin H. Ackerknecht of the University of Wisconsin Medical School concludes that unless the teaching of medical history is put on a firm basis, those responsible for medical education will have strengthened the tendency toward the "transformation of the doctor into a diagnostic and therapeutic technician." The final paper, "Historians, Empiricists, and Prophets," by Dr. Paul Schrecker, discusses what the historian is and what he is not.

Provocative and stimulating, this little volume should be rewarding to the physician who is interested in medicine as an art as well as a science.—*MAE M. LINK, Ph. D.*

PRINCIPLES OF INTERNAL MEDICINE. Editors: *T. R. Harrison, Raymond D. Adams, Ivan L. Bennett, Jr., William H. Resnik, George W. Thorn,* and *M. M. Wintrobe.* 3d edition. 1,839 pages; illustrated. The Blakiston Division, McGraw-Hill Book Company, Inc., New York, N. Y., 1958. Price $18.50.

This large, 1,800-page textbook of medicine may be obtained as a single volume or in two smaller separate volumes. There are six editors, each a well-known clinician, investigator, and teacher. There are 92 additional contributors, most of whom are faculty members of various medical schools.

The format and organization of this third edition is similar to the second edition. A few new chapters have been added and many sections have been revised or rewritten. The material is presented in a clear, direct, and detailed manner, and there are many outstanding sections in this book. Each of the editors has made extensive contributions in his own specialized field, and the combined efforts of all have produced an up-to-date, authoritative, fundamental teaching textbook on the principles of internal medicine.

This book is unique as a standard textbook of medicine. Basically, the authors attempt to present material in the same order provided the student by a school curriculum. The early chapters deal with the cardi-

nal manifestations of disease such as pain, fever, jaundice, weight alterations, et cetera, and then take up the biologic considerations, metabolic and endocrine disorders, chemical, physical, and biological agents, and diseases associated with reactions to stress and to antigenic substances. This part of the book, with stress on the correlation of the basic sciences to medicine, is excellent. It deals with pathologic physiology and metabolic disturbances as well as with disorders of nervous function with both the psychiatric and neurologic concepts integrated.

The latter half of the book considers diseases of the organ systems. In order not to repeat, there are many references to related items which are discussed in other sections of the book. Some may object to such a cross-reference system; however, it should prove a more adequate coverage of a disease state which has numerous ramifications than an attempt at a complete treatise on each disease entity.

An appendix gives laboratory values of clinical importance.

The only minor criticism offered is that some discussions of treatment of a disease are of a general nature, omitting details or failing to discriminate between the better and the less effective remedies.

This book is most enthusiastically recommended as a text or reference work for those students and physicians interested in the specialty of internal medicine.—*DOSS O. LYNN, Col., MC, USA*

ADVANCES IN ELECTROCARDIOGRAPHY, edited by *Charles E. Kossmann*, B. S., M. D., Med. Sc. D., F. A. C. P. 280 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1958. Price $6.75.

This monograph evolved from the lectures given as the course of "advanced electrocardiography" in the postgraduate division of New York University at intervals since 1947. The book is divided into five parts. The first is an excellent discussion of the physiology of the source of potential and the bio-electrics of myocardial cells. The dynamics of the "sodium pump" theory as the origin of the transmembrane potential and its explanation of the action of autonomic nerves and chemical moderators is very well summarized. Part two discusses the electrical field of the heart on the basis of the dipole theory source of potential. The character of this electrical field in the irregular shaped volume conductor and the character of the conducting medium is developed with some rather involved mathematics. This leads to a discussion of the present status of plain and semi-orthogonal system of vectorcardiography. The third part is an integrated discussion of the present concepts of the spread of excitation and recovery. This part begins with a discussion of the endocardial, myocardial, and epicardial leads and proceeds into a well illustrated and timely essay on intraventricular conduction including bundle branch block, parietal block, incomplete block and ventricular hypertrophy. This discussion is followed by a chapter on myocardial injury and the electrocardiographic interpretation of congenital heart disease. The fourth part discusses the current concepts of the mechanisms of normal rhythm

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and dysrhythmias. The fifth part is an excellent short summary. The author-editor and his contributors have concisely presented the major fundamental theories and current trends. The mathematical development in places assumes the reader is familiar with both trigonometry and calculus and is somewhat slow reading for those not current in these subjects. The review of this book gives one the feeling that he has "touched base" once again on the subject of electrocardiography. The monograph will appeal to cardiologists and should stimulate wide interest among all internists.

—*WILLIAM D. PRESTON, Col., USAF (MC)*

PSYCHOENDOCRINOLOGY, edited by *Max Reiss*, M. D., D. Sc. 208 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1958. Price $7.00.

The authors present a theory of "endocrine psychiatry" which interrelates personality pattern, emergency situation, and endocrine equilibrium—and also the dependence of personality pattern and endocrine function on genetic factors. This theoretical coat of arms explains many contradictions; indeed, it would appear to explain all the difficulties that have beset psychiatrists. The authors make a plea for endocrine evaluation, and for appropriate treatment to restore endocrine balance. If a mentally disturbed patient should prove not to be in hormonal imbalance, the therapist has his choice: (1) hospitalization and rest have of themselves normalized the imbalance; (2) present technics are not delicate enough to demonstrate the imbalance; (3) every individual has his own pattern of hormone equilibrium, and emotional changes may be associated with exceedingly small variations.

This book has a number of glaring typographic errors. The number of patients dealt with is small. Results have not been checked against control groups. Assessment of response to treatment depends on clinical judgment and is undesirably subjective.

—*SAMUEL V. THOMPSON, Capt., MC, USN*

MODERN TRENDS IN GASTRO-ENTEROLOGY (Second Series), edited by *F. Avery Jones*, M. D., F. R. C. P. Foreword by *C. F. W. Illingworth*. 439 pages; illustrated. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, N. Y., 1958. Price $16.

This excellent publication and its companion volume, published a few years ago, should be in the library of every gastroenterologist. Although the editor states that the work is in no sense intended to be a comprehensive treatise on gastroenterology, the book, along with the earlier volume by the same editor, actually covers the most important aspects of the alimentary tract and its diseases. The work is essentially a series of separate treatises on gastroenterological subjects. Anatomists, physiologists, pharmacologists, radiologists, physicians, and surgeons are all listed as contributory authors.

The book is largely the production of British and Australian authorities, although a few chapters were written by American and Swedish clinicians. It often has been claimed that most textbooks of medicine

are obsolete before they are published. This allegation hardly applies here. To a surprising degree, the most recent advances in alimentary tract diseases are presented.

In the opinion of this reviewer, the chapter on carcinoid tumors by Waldenstrom and his colleagues, is the finest presentation of that subject available today. The sections on steatorrhea and the blind loop syndrome, and massive resection of the small intestine were especially good. It is obvious that Bockus and his Philadelphia group do not share the enthusiasm for steroids in the treatment of ulcerative colitis that Kirsner and the Chicago group do. The British surgeon, Brooke, has had a wide experience with ulcerative colitis. One gathers that he favors earlier surgery for this disease than do such American authorities as Bargen and others. Cummack's chapter on radiology of the biliary tract is excellent. He seems to have had greater success with intravenous cholecystography than most radiologists on this side of the Atlantic. Jones and Tanner evaluate the standard surgical operations for peptic ulcer. They are more enthusiastic advocates of the Billroth II procedure than most American surgeons. Howat's section on the tests of pancreatic function was most comprehensive and informative, but the diagnosis of chronic relapsing pancreatitis still presents many difficulties.

The illustrations, photographs, statistical tables, and colored plates of the book are excellent, and the reproductions of x-ray films are especially clear. Each chapter is followed by an extensive bibliography. This work is unequivocally recommended for all who deal with diseases of the alimentary tract. —*EMMETT L. KEHOE, Col., MC, USA*

CLINICAL STUDIES IN CULTURE CONFLICT, edited by *Georgene Seward*, Ph. D. 598 pages; illustrated. The Ronald Press Company, New York, N. Y., 1958. Price $7.

Most students of human behavior acknowledge the importance of cultural forces in the study of personality in emphasizing the need for understanding an individual in terms of his own cultural frame of reference. The paucity of empirical data in this new field of learning has prompted the presentation of case material to help make concrete some of the specific ways in which culture may affect personality. Those who have accepted cultural relativism in behavior pathology will welcome this casebook of studies as an obvious attempt at spelling out in detail some of the processes involved in handling diagnosis and treatment of problems which involve culture disturbances. A book for clinicians on the psychology of minority groups, it presents 20 clinical case studies by 24 contributors, most of whom are psychologists, psychiatrists, and anthropologists. A wide range of psychopathology is covered by the book to demonstrate the cultural complications in the diagnosis and treatment of a variety of conditions. Treatment procedures utilized were broadly psychoanalytical (neofreudian), but the particular therapeutic approach varied from brief supportive measures to deeper analysis, depending on the needs of the particular case. The case reports represent a multidisciplinary

attack of the clinical team collaborating in this field of socioclinical research. The book should be of value to any member of the clinical team. It should alert him to recognize the importance of cultural forces in the patient's background. The volume is intended primarily as a diagnostic aid designed to fill the need for a casebook of clinical studies in culture conflict.—*FRANK KILLIAN, Jr., Lt. Col., USAF (MSC)*

ORR'S OPERATIONS OF GENERAL SURGERY, by *George A. Higgins,* M. D., F. A. C. S., and *Thomas G. Orr,* Jr., M. D., F. A. C. S. 3d edition. 1,016 pages; with 1,990 step-by-step illustrations on 835 figures. W. B. Saunders Company, Philadelphia, Pa., 1958. Price $20.

This lengthy book is a monument to a master surgeon, Thomas G. Orr, recently deceased Professor of Surgery of the University of Kansas School of Medicine. It is also something of a token of remembrance of the golden era of general surgery before its cannibalization and marcescence brought about by specialization. With no less courage than the master general surgeons of the past, the text boldly presents most of the surgical operations commonly performed on the human body. First brought out in 1944 by the senior Orr, this revised third edition has been completed by two of his former students, one of whom is his son. The original pattern and substance has been faithfully retained—in fact, the authors have loyally included some of the original dogma which is not currently as acceptable as it was in 1944. For example, they still proclaim the superiority of silk suture material and advocate the packing of wounds with vaseline gauze, despite waning enthusiasm elsewhere.

However, there is much material of lasting importance which is properly perpetuated. Wound healing is the subject of the opening chapter, and this choice is testimony in itself of the sound qualities of the senior Orr. This important subject is given the emphasis and treatment it warrants.

There are sections on general considerations and also on dangers and safeguards in connection with the operations described. This excellent and valuable addition makes the book more than a mere surgical atlas; it is really a textbook of surgery emphasizing technical considerations.

The extent of this undertaking, attempting to describe such a multitude of surgical procedures, is of such magnitude as to raise the question as to whether a single volume can adequately contain all the important surgical procedures performed at present, and whether any two general surgeons can properly select the procedures to be included. In general, the authors have succeeded admirably, but there are indications here and there that selection by specialists might have been more advantageous. For example, the choice of Ariel's article in preference to Urban's ignores the original author with the widest experience and best description available of en bloc internal mammary external node excision combined with radical mastectomy. Moreover, the procedure described is not only inadequate but im-

possible, since the chest wall defect cannot be closed by drawing the ribs together transversely, as described.

Most illustrations are clear and easy to follow. An exception is the series on total laryngectomy, which has lost so much by reproduction as to be practically worthless in supporting the excellent descriptive text of this procedure.

This book should be of interest and value to medical students in giving them some understanding of operative procedures. A junior resident in general surgery could find it helpful, as would general practitioners called upon for emergency surgery. As a single volume with such extensive coverage of the entire surgical field, it would certainly be most welcome in the pack of the isolated physician, no matter what his skill or training.—*ROALD N. GRANT, Capt., MC, USN*

REGIONAL ILEITIS, by *Burrill B. Crohn,* M. D., and *Harry Yarnis,* M. D., with special contributions by *Richard H. Marshak,* M. D., and *David A. Turner,* Ph. D. 2d revised edition. 239 pages; illustrated. Grune and Stratton, Inc., New York, N. Y., 1958. Price $7.25.

Twenty-five years of experience with 676 personally observed cases of regional enteritis is recorded and analyzed in this monograph by the man who has given his name to the malady. It is now recognized that the disease is not uncommon, that it may affect not only the terminal ileum but also any portion of the enteric canal from esophagus to colon. Combined ileocolitis was seen in 64 cases, diffuse ileojejunitis in 70 cases, while the remaining 542 cases were classified as regional or terminal ileitis.

The history, etiologic factors, and pathology are discussed. There is an excellent presentation of the clinical features of the disease, its complications and diagnosis. Medical management is detailed, the various indications for surgery explained, and the experience with different surgical procedures is discussed. A number of tables are used to present the data on these cases. About 20 per cent escaped operation, and half of these were "well," without recurrence at the time of writing. The surgical results were good in 60 to 70 per cent, and 30 per cent had recurrence of the disease. The short circuiting operation is preferred to resection of the diseased bowel. Separate chapters are used to describe acute ileitis, ileojejunitis, and ileocolitis. Medical therapy is urged for these forms of the disease, in view of the poor results of surgical measures.

The authors have presented in a useful fashion their knowledge and the results of their experience in treating a most difficult and discouraging disease. Much has been added since the first edition appeared in 1949, namely, longer follow-up of some patients, a wider and more detailed description of the disease, and several new measures useful in medical therapy. Physicians who treat patients with abdominal complaints will find this book useful, all will find it interesting.

—*BENJAMIN H. SULLIVAN, Jr., Col., MC, USA*

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, Vol. 68, Art. 3, pages 657-1266, April 24, 1958. Editor in Chief, *Otto V. St. Whitelock;* Managing Editor, *Franklin N. Furness;* Associate Editors, *Margaret P. Cameron* and *Francis S. Stahl.* "Comparative Clinical and Biological Effects of Alkylating Agents." Consulting Editor, *David A. Kamofsky.* 609 pages; illustrated. The New York Academy of Sciences, New York, N. Y., 1958.

The papers contained in this volume were presented at a conference on alkylating agents in 1957. As with most annals of the Academy it contains a wealth of information. Detailed reactions, preparative methods, and the fundamental characteristics of alkylating agents are covered, including radiomimetic agents. Speakers also covered the pathologic and hematologic effects of numerous alkylating agents, and their pharmacological activity, distribution, and fate. Of special interest to the physician are the large number of titles dealing with clinical trials of these agents in lymphoma, leukemia, and bronchiogenic carcinoma. Two excellent papers are those describing recommended procedures for clinical trials of alkylating agents and a summary report of the status of alkylating agents in clinical cancer chemotherapy. All of the papers are well documented and illustrated. The article would seem a must for anyone concerned working in the cancer chemotherapy field.—*DAVID F. HERSEY, Capt., USAF (MSC)*

THE YEAR BOOK OF ENDOCRINOLOGY (1957-1958 Year Book Series), edited by *Gilbert S. Gordan,* M. D., Ph. D., F. A. C. P. 381 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $7.50.

The articles abstracted in this volume have been well selected and are presented in a concise and clear manner. The abstracts represent the more important recent articles from the American and foreign literature pertaining to clinical and investigative endocrinology. An effort has been made by the editor to review articles not generally available to most American physicians. This volume is not intended to serve as a textbook of endocrinology, but rather as a synopsis of the recently published literature on the subject. As a result, some aspects of endocrinology are not thoroughly discussed; however, the text covers the vast majority of the facets in the field of endocrinology.

This excellent summary of the recent literature pertaining to endocrinology should be included in the libraries of endocrinologists, internists, obstetricians and gynecologists, as well as all teaching hospitals.—*RALPH D. ROSS, Capt., USN*

THE YEAR BOOK OF ORTHOPEDICS AND TRAUMATIC SURGERY (1957-1958 Year Book Series), edited by *Edward L. Compere,* M. D., F. A. C. S., F. I. C. S., with a section on PLASTIC SURGERY, edited by *Neal Owens,* M. D., F. A. C. S., F. I. C. S. 463 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $7.50.

This yearbook is an interesting, stimulating volume containing the usual orthopedic reviews of interesting and timely literature for the past year, as well as a new section on plastic surgery. The subjects reviewed in the plastic surgery section, which is edited by Dr.

Neal Owens, Professor of Plastic Surgery at Tulane University School of Medicine, includes such subjects as reconstruction, tissue transplants, burns, congenital anomalies, neoplasms, cosmetic, and miscellany. This is a most welcome addition to the yearbook as many of the overlapping problems of the orthopedic and plastic surgeons are reviewed in a terse, pertinent manner.

There are 59 footnotes by the editors following various articles, and these are concise, brief, and stimulating as they constantly refer us to a review of fundamental principles of surgery.

The usual yearbook quiz is included, and its 21 questions make an introduction to this volume somewhat exciting and interesting. For the busy surgeon, this book represents a condensation of excellent literature review which he would never quite find time enough to sift for himself. The yearly chapter entitled "Geriatric Orthopedics" has again been included in the survey. It is especially recommended for residents in training. —*HAROLD S. McBURNEY, Col., MC, USA*

THE YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND NEUROSURGERY (1957-1958 Year Book Series), edited by *Roland P. Mackay,* M. D.; *S. Bernard Wortis,* M. D.; and *Oscar Sugar,* M. D. 624 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $8.

This is essentially a reference work. It presents excellent summaries of recent articles from American and foreign periodicals that seemed important to the editors; they must be congratulated on their wisdom in sorting the wheat from the chaff. Especially welcome are the pithy editorial comments that are added as footnotes to some of the abstracts. Equally welcome is the editors' mention of recent worthwhile books in the several fields covered, as well as Dr. Wortis' suggestion as to several articles which should be read in full rather than in abstracted form.

This volume keeps us informed on such diverse subjects as current theories of multiple sclerosis, Heath's work on the isolation of taraxein from schizophrenics, Aberfeldt's serum test for schizophrenia, and current opinions on sympathectomy. Almost all physicians will find useful the chart and table listing all the current tranquilizing drugs and other psychopharmacological agents and their areas of usefulness. This yearbook fulfills a definite need, mostly for the busy specialist and resident.

—*JOHN F. McMULLIN, Capt., MC, USN*

THE YEAR BOOK OF DERMATOLOGY AND SYPHILOLOGY (1957-1958 Year Book Series) edited by *Rudolf L. Baer,* M. D., and *Victor H. Witten,* M. D. 492 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $8.

This is the usual fine compilation of abstracts and reviews of leading dermatologic articles that appeared in the literature between 1956 and late 1957. The book contains a total of 377 articles reviewed in abstract, together with editorial comments. The lead article continues

as Part 2, The Editor's Review of Allergic Eczematous Contact Dermatitis, of which Part 1 appeared in the 1956-1957 Year Book.

Of the 377 articles abstracted, only about 100 had no editorial comment. In these it was obvious from reading the abstract, that no comment was necessary. These comments are quite worthwhile, as the editors note any changes in the subject matter or treatment wherever necessary, thus giving the editors a chance to assert their opinion and to point out certain simple truths which should be obvious but may have been long-forgotten or overlooked. In addition to this they provide stimulating food for thought for further studies in research.

Another important change in this Year Book, is that the editors have placed some of the abstracts or investigative studies with the clinical reports to which they pertain, rather than all being included in one chapter, as was done previously. As the editors state, this should improve the usefulness of the book. The only major shortcoming appears to be that there is such a time lapse between the appearance of the original article and its review and abstraction in this volume. This of course is understandable, although regrettable. The editors acknowledge this fact and in the discussion on the use of the new corticosteroids, methylprednisolone and triamcinolone, point out that although these drugs have been given extensive clinical trial, publications regarding their dermatologic effects have not as yet appeared in time to permit inclusion in this volume. This is a worthwhile quick reference handbook, which should be in every dermatologist's library and because of the material, tables, and discussion in the lead article should appeal equally to internists, allergists, and industrial physicians, not only for reference but for general reading from time to time.

—*EARL S. HALLINGER, Jr., Lt. Col., MC, USA*

SKIN GRAFTING, by *James Barrett Brown*, M. D., and *Frank McDowell*, M. D. 3d edition. 411 pages; 328 figures and 6 color plates. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $15.

This book is written for the resident, the general surgeon, and the general practitioner. It is a delightful, authoritative presentation of the general subject of skin grafting by authors with wide experience. Burns, trauma, and deformities are covered adequately. Various types of grafts are discussed with consideration of why they work, where each type is most valuable, and what the pitfalls are. The reader is told how and where to cut grafts of various types for various purposes, how they should be applied, how to prepare the recipient area, and how to care for both the donor and recipient sites postoperatively. Repair of various areas of the body and defects resulting from various causes, and the faults of certain types of grafts are explored. Never is the mistake made of considering the human organism as a mere platform on which to graft sheets of skin. Equipment and methods are considered in enough detail to permit a physician to establish his own skin bank and adequately graft his needy patients using autografts or homografts. Explanations of both practical and fundamental

matters are simple, clear, occasionally humorous, and never is the reader faced with the complicated, detailed, and unnecessarily mysterious exposition in which some plastic surgeons shroud their specialty. This book is a contribution to the library of any physician who is not a specialist in plastic surgery but who may, on occasion, be required to use skin grafts in the repair of defects.

—DON S. WENGER, Col., USAF (MC)

PEDIATRIC GYNECOLOGY, With Sections on Urology and Proctology, by *Goodrich C. Schauffler*, M. D. 4th edition. 349 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $9.

The author states in the foreword that the present volume is an "almost complete rewriting of the previous edition." In reviewing this book I have had to take exception to this remark, because except for the addition of a new and short chapter on "The Intersexes and Pseudohermaphroditism" the volume is almost word for word a copy of the third edition. The similarity was so marked that one can turn from a subject in the fourth edition to the same subject in the third edition and read on without any interruption in the train of thought. This is likewise true for the list of illustrations.

It is believed that Dr. Schauffler has not sufficiently emphasized the necessity and need for *cultures* in the child or infant before a diagnosis of gonorrheal infection is made—relying too much on smear diagnosis.

In my opinion, the owner of the third edition would hardly be justified in purchasing the fourth edition because of the very slight difference in content. Otherwise, *Pediatric Gynecology* would be most useful as a reference for the resident in pediatrics.

—HENRY J. HUNTER, Capt., MC, USN

MODERN CLINICAL PSYCHIATRY, by *Arthur P. Noyes*, M. D., and *Laurence C. Kolb*, M. D. 5th edition. 694 pages. W. B. Saunders Company, Philadelphia, Pa., 1958. Price $8.

In this day of rapid advances in the therapy of mental diseases, standard texts on psychiatry are soon outdated. Such was the situation with Noyes' excellent fourth edition which appeared in 1953. In the fifth edition, the authors have incorporated all the latest developments in treatment, including drug therapy. The format of the book has been changed slightly, and almost all chapters have been rewritten to varying degrees. The book now has a coauthor, Dr. Lawrence C. Kolb, Professor of Psychiatry, Columbia University. It is interesting to note that the word hydrotherapy does not appear in the index, nor is this method of therapy discussed in the text. In chapter 27 on schizophrenia one reads with interest, "At the present time the classical concepts of Kraepelin, Meyer, Bleuler, and Freud are all more or less shattered." Numerous other improvements have been made throughout the text which truly make it a modern textbook of psychiatry. It is highly recommended to all students of psychiatry.

—JAY F. TUTTLE, Lt. Col., MC, USA

PHYSICS FOR THE ANAESTHETIST, Including a Section on EXPLOSIONS, by Sir *Robert MacIntosh*, D. M., F. R. C. S. E., F. F. A. R. C. S., M. D. (hon. causa) Buenos Aires and Aix-Marseilles; *William W. Mushin*, M. A., M. B., B. S., F. F. A. R. C. S.; and *H. G. Epstein*, M. A., Ph. D., F. F. A. R. C. S. 2d edition. 443 pages; illustrated by Miss *M. McLarty* and Miss *M. Beck*. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $15.50.

Since the first edition in 1947, this volume has been completely revised and a large section on explosions has been added. Satisfactorily referenced, the excellent illustrations include diagrams and photographs of early and modern anesthesia equipment. The authors review the physical attributes of liquids and gases and their effects on clinical response during anesthesia. The functions of many items of equipment under clinical conditions are explained by diagrams and illustrations of the components of various type reducing valves, flowmeters, mixing chambers, and vaporizers. Internal and external respiration is discussed from the standpoint of osmosis, solubility, and the diffusion of gases. The last third of the book is devoted to a comprehensive presentation of the factors which contribute to fires and explosives. Several approaches are offered to the prevention of these anesthetic disasters. The publication offers a practical contribution to the anesthesiologist interested in harmonizing the physiologic behavior and the physical characteristics of the commonly used gases, liquids, and vapors. It offers a valuable source of ready reference for the student as well as the expert; and would make a useful addition to the library of any physician who has occasion to enter a surgical suite.—*ROBERT F. CORWIN, Col., USAF (MC)*

VETERINARY ANAESTHESIA, by *John G. Wright*. 4th edition. 317 pages; illustrated. The Williams & Wilkins Company, Baltimore, Md., 1957. Price $6.75.

This book has a reputation as one of the standard texts on veterinary anesthesia. The fourth edition, while retaining most of the material from previous editions, has been expanded to discuss and evaluate several methods and agents which have been developed since the publication of the third edition in 1952. This includes some of the earlier tranquilizers and the curare-like drugs. A refreshing aspect of the book is the author's comments and discussions of many of the agents and methods discussed. They include many valuable practical considerations. He has surveyed the available publications on the subject, and incorporated the experience and observations of others in the field. This book is a valuable reference for both the student and the practitioner. It provides a concise source of information for the veterinarian who does not routinely work on all species of animals, in that it gives him a comprehensive discussion of the methods and agents which have been found to be most advantageous for most of those species with which he commonly comes in contact. The American reader will suffer some confusion because of the variations in proprietary drug names. Also, some of the drugs and equipment which are discussed are not readily available on the American market.

—*ROBERT M. NIMS, Lt. Col., VC, USA*

OPHTHALMIC PLASTIC SURGERY, by *Sidney A. Fox*, M. S. (Ophth.), M. D., F. A. C. S. 2d revised edition. 324 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1958. Price $15.

Designed for the practicing ophthalmologist, this book describes in an understandable manner the basic classical operations commonly used in everyday practice. The brief review of anatomy in the beginning is excellent for the occasional operator. Discussions of various surgical technics are brief but clear and to the point. The author not only describes classical procedures but he inserts minor changes here and there which, in his experience, have ensured better results. His "double triangle" procedure for correction of entropion is simple and seems easy to perform. When he describes several procedures for correction of a certain defect, he criticizes the results of each procedure and gives specific indications for each operation. Illustrations are numerous and realistic. This book does not include all the possible operations for the ophthalmic plastic surgeon but it describes most of them that give satisfactory results. It is recommended for all practicing ophthalmologists and medical libraries.—*JAMES L. FUELLING, Capt., MC, USN*

SURGERY OF THE CHEST, A Handbook of Operative Surgery, by *Julian Johnson*, M. D., D. Sc. (Med), and *Charles K. Kirby*, M. D. 2d edition. 398 pages; illustrated by *Edna Hill*. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $9.75.

Drs. Johnson and Kirby have enlarged their most excellent handbook and present what is believed to be an unexcelled, concise, well-illustrated text. The enlargements consist almost entirely of new operations in cardiac surgery. In keeping with the first edition, this book fills a true need, and all who are interested in the subject of chest surgery will find it a valuable addition. To the residents in particular this book should find great usage.

—*JAMES H. FORSEE, Brig. Gen., MC, USA*

DENTAL CLINICS OF NORTH AMERICA, Symposium on The Interrelationship of Oral and Systemic Disease. *Lester W. Burket*, D. D. S., M. D., Consulting Editor. 543 pages; illustrated. W. B. Saunders Company, Philadelphia, Pa., 1958.

The 25 contributors to the volume are outstanding authorities, and their articles contain valuable and practical information. Because the interrelationships between oral and systemic disease are numerous and significant, space does not permit a coverage of the many diseases, diagnostic procedures, treatments, and other subjects considered. A valuable feature of the book is the inclusion at the end of most chapters of a list of pertinent bibliographic references. These references have been carefully selected so that the reader who wishes to develop a bibliography on any particular phase of the literature may do so. This book is recommended to the practicing dentist whose desire for knowledge and understanding transcends the ordinary dental knowledge. Also, this book would be a valuable addition to the professional library of any practicing physician.

—*THOMAS SALIMENO, Jr., Capt., USAF (DC)*

DRUGS, Their Nature, Action and Use, by *Harry Beckman*, M. D. 728 pages; illustrated. W. B. Saunders Company, Philadelphia, Pa., 1958. Price $15.

This is a unique textbook of pharmacology, written for the undergraduate medical student. It is appreciably smaller than most of the books in common use with less than half the pages of some standard works. The style of presentation is different in several ways. For one, it is written in the first person and for another the material is arranged in an unusual way. There is an interesting and entertaining initial chapter, entitled "A justification of pharmacology and pharmacologists," followed by a section including the sources of drugs, the relation of structure to activity, the nature of drug action, the fate of drugs, factors affecting administration, drug addiction, drug sensitivity, and the preparation and writing of prescriptions. The subsequent organization is more conventional, and is based primarily on organ systems and tissues. Figures and diagrams are abundant and the references at the end of each chapter are numerous and well chosen. The opinions of the author are frequently expressed but he is careful to separate opinion and conjecture from established fact. Attention is frequently called to extensive gaps in our knowledge of drug action and the urgent need for effective agents in certain areas. The book should prove to be very interesting and informative to medical and graduate students and delightful reading to the physician and medical scientist interested in pharmacology. —*PAUL K. SMITH, Col., USAFR*

DIAGNOSTIC LABORATORY HEMATOLOGY, by *George E. Cartwright*, M. D. 2d edition, revised and enlarged. 250 pages; illustrated. Grune and Stratton, Inc., New York, N. Y., 1958. Price $6.50.

This up-to-date revision of laboratory procedures is of unusual value for clinical physicians and surgeons, as well as for the clinical laboratory technician. The author presents his material in important practical detail with the clinical hematologic approach inspired by his associate and chief, Dr. M. M. Wintrobe. The book is arranged into well-organized sections. Among the topics is a description of laboratory determinations of hemoglobin and the other red blood cell tests, and those for platelets and white blood cells. The causes of various forms of anemia and pancytopenia are listed for easy reference, as are the hemorrhagic disorders and the factors associated with these conditions. The hemolytic diseases are thoroughly presented from the laboratory diagnostic aspect. The author states that in obtaining blood for the various studies it is important to use the proper anticoagulant. He recommends the double oxalate or, if platelets are to be studied, dipotassium ethylenediaminetetraacetate (Versene). An especially helpful section details the use of special blood smear stains and the value of bone marrow studies in various clinical conditions. The book closes with a report on the biochemistry of jaundice, and blood and urine pigments, and some of the special protein determinations aiding differential diagnosis of certain diseases. One interesting point again brought forth is the limited value of the determination of erythrocyte sedimentation rate. —*U. R. MERIKANGAS, Col., MC, USA*

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

EMERGENCY WAR SURGERY, U. S. Armed Forces Issue of NATO Handbook, Prepared for Use by the *Medical Services of NATO Nations, United States Department of Defense.* 411 pages. United States Government Printing Office, Washington, D. C., 1958. Price $2.25.

PROGRESS IN CARDIOVASCULAR DISEASES. Volume I, Number 1: Progress in Cardiac Surgery, edited by *Charles Friedberg,* M. D. 108 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1958.

ADVANCES IN INTERNAL MEDICINE, edited by *William Dock,* M. D., and *I. Snapper,* M. D. Volume IX. 311 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $8.50.

PHYSICAL DIAGNOSIS, by *F. Dennette Adams,* M. D. 14th edition. 926 pages; illustrated. The Williams & Wilkins Company, Baltimore, Md., 1958. Price $12.

CLINICAL OBSTETRICS AND GYNECOLOGY, Vol. 1, No. 2, June 1958. Toxemias of Pregnancy, edited by *Louis M. Hellman,* M. D. Fibromyomas of the Uterus, edited by *Robert A. Kimbrough,* M. D. 533 pages. Paul B. Hoeber, Inc., New York, N. Y. Price $7.50.

DANGER IN THE AIR, by *Oliver Stewart.* 194 pages; illustrated. Philosophical Library, Inc., New York, N. Y. Price $6.

ROENTGEN-DIAGNOSTICS, Progress Volume 1, by *H. R. Schinz, R. Glauner,* and *E. Ueblinger,* with the collaboration of *W. E. Baensch, J. E. W. Brocher, U. Cocchi, R. Glocker, W. Hess, R. Janker, O. Norman, R. Prevot, G. Schoch, E. Ueblinger, S. Welin, J. Wellauer,* and *E. Zdansky.* Translated from the German by *James T. Case,* M. D., D. M. R. E. 623 pages; with 545 figures containing 892 illustrations. Grune and Stratton, Inc., New York, N. Y., 1958. Price $35.

PROCEEDINGS OF THE NINTH ANNUAL CONFERENCE ON THE NEPHROTIC SYNDROME, Held at the National Institutes of Health, Bethesda, Md., edited by *Jack Metcoff,* M. D. 248 pages. The National Nephrosis Foundation, Inc., New York, N. Y., 1958.

ANOMALIES OF INFANTS AND CHILDREN, by *D. McCullagh Mayer,* D. D. S., M. D., F. A. C. S., F. I. C. S., and *Wilson A. Swanker,* M. D., F. A. C. S., F. I. C. S. 454 pages; illustrated. Blakiston Division, McGraw-Hill Book Company, Inc., New York, N. Y., 1958. Price $12.

MEDICAL TERMINOLOGY SIMPLIFIED, by *Louis L. Perkel,* M. D. Foreword by *Charles L. Brown,* M. D., F. A. C. P. 103 pages. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $3.85.

THE ART OF STUDYING, A Guide for Student Nurses, by *Emma Spaney,* Ph. D., and *Louise A. Jennings,* R. N., M. A. Illustrated by *Jean McConnell.* 143 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $2.

LES PARASITOSES RESPIRATOIRES FRÉQUENTES, by *A.-P. Jarniou*, Professeur au Val de Grâce Médecin de l'Hôpital Militaire Percy, and *A. Moreau*, Médecin Phtisiologue de l'Hôpital Militaire Percy, with the collaboration of *P. Bourdet*, Chirurgien des Hopitaux Militaires. Preface by Professeur *Étienne Bernard*. 122 pages; illustrated. Vigot Frères, Éditeurs, 23, Rue de l'Ecole-de-Médecine, Paris-VI^{e}, 1958.

ETUDES SUR L'ALLERGIE ET L'IMMUNITE DANS L'INFECTION TUBERCULEUSE, by *Max Fourestier* and *Alain Blacque-Belair*. Preface by M. le Professeur *Etienne Bernard*. 160 pages; illustrated. Vigot Frères, Éditeurs, 23, rue de l'Ecole-de-Médecine, Paris-VI^{e}, 1957. Price $1.95.

AVIATION ET TUBERCULOSE PULMONAIRE, by Docteur *Pierre Weiller*. Preface by Professeur *Robert Monod*. 232 pages; illustrated. Vigot Frères, Éditeurs, 23 Rue de l'Ecole-de-Médecine, Paris-VI^{e}, 1958. Price $3.60.

COUNTERFEIT-SEX, Homosexuality, Impotence, Frigidity, by *Edmund Bergler*, M. D. 2d, enlarged edition. 380 pages. Grune and Stratton, Inc., New York, N. Y., 1958. Price $6.50.

CRIME AND INSANITY, edited by *Richard W. Nice*. 280 pages. Philosophical Library, Inc., New York, N. Y., 1958. Price $6.

CIBA FOUNDATION COLLOQUIA ON ENDOCRINOLOGY, VOLUME XII - Hormone Production in Endocrine Tumours. Editors of the Ciba Foundation: *G. E. W. Wolstenholme*, O. B. E., M. A., M. B., B. Ch., and *Maeve O'Connor*, B. A. 287 pages; with 58 illustrations and cumulative index to Volumes 1-12. Little, Brown and Company, Boston, Mass., 1958. Price $9.

LIGAMENT AND TENDON RELAXATION (SKELETAL DISABILITY) TREATED BY PROLOTHERAPY (FIBRO-OSSEOUS PROLIFERATION), with special reference to Occipito-Cervical and Low Back Disability—Trigger Point Pain, Referred Pain, Headache and Sciatica, by *George Stuart Hackett*, M. D., F. A. C. S. 3d edition. 151 pages, illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $6.75.

COCCIDIOIDOMYCOSIS, by *Marshall J. Fiese*, M. D., F. A. C. P. Foreword by *Charles E. Smith*, M. D. 253 pages, illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $9.50.

THE PHYSICIAN AND GROUP PRACTICE, edited by *Edwin P. Jordan*, M. D. Foreword by *Russell V. Lee*, M. D. 238 pages. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $6.75.

EPILEPSY HANDBOOK, by *Frederic A. Gibbs*, M. D., and *Frederick W. Stamps*, M. D. 101 pages. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $4.75.

BLOOD GROUPS IN MAN, by *R. R. Race*, Ph. D., M. R. C. S., F. R. S., and *Ruth Sanger*, Ph. D., B. Sc., with a foreword by Professor Sir *Ronald Fisher*, F. R. S. 3d edition. 377 pages. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $8.50.

FLORENCE NIGHTINGALE AND THE DOCTORS, by *Zachary Cope*, M. D. 163 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $5.

PATIENT-CENTERED TEACHING, by *Emily C. Cardew*, R. N., M. S. For use with Study Guide for Clinical Nursing. 2d edition. 29 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $1.25.

MOTIVATING PATIENTS FOR MORE EFFECTIVE DENTAL SERVICE, by *J. Lewis Blass*, Ph. G., D. D. S., F. A. C. D., F. A. D. M. With contributions by *Ben B. Drob*, D. D. S.; *Reuben Fogelson*, D. D. S.; *Alice Gustav*, A. B., A. M., Ph. D.; and *William Wolf*, B. S., M. D., Ph. D. 176 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $6.50.

ELECTROCARDIOGRAPHY, by *Michael Bernreiter*, M. D., F. A. C. P. 134 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $5.

ILLUSTRATED PREOPERATIVE AND POSTOPERATIVE CARE, by *Philip Thorek*, M. D., F. A. C. S., F. I. C. S. With drawings by *Carl T. Linden*. 98 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $5.

TWENTY THOUSAND NURSES TELL THEIR STORY, A Report on Studies of Nursing Functions, Sponsored by the American Nurses' Association, by *Everett C. Hughes, Helen MacGill Hughes*, and *Irwin Deutscher*. With a foreword by *Agnes Ohlson*. 280 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $5.75.

CLINICAL ORTHOPAEDICS. *Anthony F. DePalma*, editor-in-chief, with the assistance of the Associate Editors, The Board of Advisory Editors, The Board of Corresponding Editors. No. 11, Spring, 1958. 257 pages; illustrated. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $7.50.

EDUCATION FOR NURSING LEADERSHIP, by *Eleanor C. Lambertsen*, Ed. D. 197 pages. J. B. Lippincott Company, Philadelphia, Pa., 1958. Price $5.

PERIODONTOLOGY, Clinical Pathology and Treatment of the Periodontal Tissues, 3d edition, thoroughly revised. By *Edgar D. Coolidge*, B. S., D. D. S., M. S., LL. D., and *Maynard D. Hine*, D. D. S., M. S. 440 pages; 463 illustrations on 268 figures and 2 color plates. Lea & Febiger, Philadelphia, Pa., 1958. Price $8.50.

PEDIATRIC CLINICS OF NORTH AMERICA. Volume 5, Number 3: Symposium on Behavior Disorders. *Harry Bakwin*, M. D., Consulting Editor. 834 pages. W. B. Saunders Company, Philadelphia, Pa., 1958. Published quarterly. Subscription price: $15 per year.

HOSPITAL PLANNING FOR THE ANESTHESIOLOGIST, by *William H. L. Domette*, M. D. A Monograph in American Lectures in Anesthesiology, American Lecture Series, Publication Number 335, edited by *John Adriani*, M. D. 119 pages; illustrated. Charles C Thomas, Springfield, Ill., 1958. Price $5.25.

DISINFECTANTS, Their Values and Uses, by *W. E. Finch*, with a foreword by *H. Berry*, B. Sc., F. P. S., F. R. I. C. 188 pages; illustrated. The Macmillan Company, New York, N. Y., 1958. Price $5.50.

DENTISTRY FOR CHILDREN, by *John C. Brauer*, D. D. S., A. B., M. Sc., F. A. C. D.; *William W. Demeritt*, D. D. S.; *L. B. Higley*, B. A., D. D. S., M. S., F. A. C. D.; *Roy L. Lindahl*, D. D. S., M. S.; *Maury Massler*, D. D. S., M. S.; and *Isaac Schour*, Ph. D., D. Sc. 4th edition. 492 pages; illustrated. McGraw-Hill Book Company, Inc., New York, N. Y., 1958. Price $11.

VETERINARY PROTOZOOLOGY, by *U. F. Richardson*, B. Sc., M. R. C. V. S., and *S. B. Kendall*, B. Sc., Ph. D., A. R. C. S., M. R. C. V. S. 2d edition, revised. 260 pages; illustrated. Oliver & Boyd Ltd., Edinburgh, Scotland, 1957. Price $4.50.

THE YEAR BOOK OF CANCER (1957-1958 Year Book Series), compiled and edited by *Randolph Lee Clark, Jr.*, B. S., M. D., M. Sc. (Surgery), D. Sc. (Hon.), and *Russell W. Cumley*, B. A., M. A., Ph. D. 523 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1958. Price $8.

THE PRACTICE OF NUCLEAR MEDICINE, by *William H. Blahd*, M. D.; *Franz K. Bauer*, M. D.; and *Benedict Cassen*, Ph. D. Introduction by *Paul Aebersold*, Ph. D. Foreword by *Joseph F. Ross*, M. D. 407 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $12.50.

CONGENITAL ANOMALIES OF THE HAND AND THEIR SURGICAL TREATMENT, by *Arthur Joseph Barsky*, M. D., D. D. S. American Lecture Series, Publication Number 311, A Monograph in The Bannerstone Division of American Lectures in Orthopaedic Surgery, edited by *Charles Weer Goff*, M. D. 165 pages; illustrated. Charles C Thomas, Springfield, Ill., 1958. Price $5.75.

LIVE AND LET LIVE, The Moral of the Wolfenden Report, by Dr. *Eustace Chesser*, with a foreword by Sir *John Wolfenden*. 125 pages. Philosophical Library, Inc., New York, N. Y., 1958. Price $4.75.

THE WAKING BRAIN, by *H. W. Magoun*, Ph. D. 137 pages, illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $4.75.

CLINICAL NEUROANATOMY, NEUROPHYSIOLOGY AND NEUROLOGY, with a Method of Brain Reconstruction, by *Louis Hausman*, M. D. 522 pages. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $9.75.

HOMOSEXUALITY, TRANSVESTISM AND CHANGE OF SEX, by *Eugene de Savitsch*, M. D. 118 pages, illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $3.50.

PRINCIPLES OF RADIOGRAPHIC EXPOSURE AND PROCESSING, by *Arthur W. Fuchs*. 2d edition. 284 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $10.50.

SIMPLE METHODS OF CONTRACEPTION, An Assessment of their Medical, Moral and Social Implications, edited by *Winfield Best* and *Frederick S. Jaffe*, with a foreword by *R. Gordon Douglas*, M. D. 64 pages. Planned Parenthood Federation of America, New York, N. Y., 1958. Single copies are available free, except for a 25-cent charge for postage and handling.

HUMAN DISSECTION, Its Drama and Struggle, by *A. M. Lassek*, M. D., Ph. D. 310 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $6.50.

BIBLIOGRAPHY OF INTERNATIONAL CONGRESSES OF MEDICAL SCIENCES, prepared by *W. J. Bishop* under the auspices of the *Council for International Organizations of Medical Sciences* with the financial assistance of *Unesco*. 238 pages. Charles C Thomas, Publisher, Springfield, Ill., 1958. Price $5.50.

DISCUSSIONS ON CHILD DEVELOPMENT, A Consideration of the Biological, Psychological, and Cultural Approaches to the Understanding of Human Development and Behaviour. Volume 3, The Proceedings of the Third Meeting of the World Health Organization Study Group on the Psychobiological Development of the Child, Geneva, 1955. Editors: *J. M. Tanner*, M. D., D. Sc. P. M., and *Bärbel Inhelder*. 223 pages. International Universities Press, Inc., New York, N. Y., 1958. Price $5.

A DOCTOR SPEAKS HIS MIND, by *Robert I. Lee*, M. D. 120 pages. Little, Brown and Company, Boston, Mass., 1958. Price $3.

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